





MANUAL
OF THE
DISEASES OF THE EYE.

OUR limits will not allow us to notice the small work of Dr. Littell in detail; but after an attentive perusal of the whole volume, we confidently recommend it to the senior as well as junior members of the Profession. It is replete with information, yet so terse in style and compressed in bulk, as at once to entice and repay perusal. We agree in most points with the author's pathological inductions and practical precepts. The language is free from any tinge of Americanism, the descriptions are short but comprehensive, while the treatment is characterized by great prudence: on the one hand avoiding the charge of inactivity and feebleness, on the other never risking the more serious results of chronic mischief and broken health from excessive depletion, or the depressing effects of violent mercurial courses; of which faults some of our own countrymen are not entirely innocent. It is no small triumph to Dr. Littell to be able to say, that he has introduced almost all that is valuable, and every thing absolutely necessary to the student, within the compass of two hundred and fifty small pages; and we would deliberately recommend our young friends to read this work before encountering the voluminous treatises of Lawrence, Travers, Mackenzie, Middlemore, &c. *British and Foreign Med. Review, Jan. 1838.*

A
M A N U A L
OF THE
DISEASES OF THE EYE:
OR,
TREATISE ON OPHTHALMOLOGY.

BY
✓
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TO

GEORGE B. WOOD, M. D.,

P R O F E S S O R O F M A T E R I A M E D I C A

IN THE

UNIVERSITY OF PENNSYLVANIA,

THIS LITTLE VOLUME

IS INSCRIBED BY HIS FRIEND,

THE AUTHOR.

ADVERTISEMENT

TO THE FIRST EDITION.

THE importance of the organ of vision, and the facilities afforded by its structure for the investigation of the various morbid affections to which it is exposed, have always rendered it a favourite object of regard; and the numerous publications which have at different times appeared, attest alike the skill and the research of those who have cultivated with especial attention this department of Surgery. Several of these productions—the late elaborate treatises of MACKENZIE, LAWRENCE, and MIDDLEMORE, in particular,—have left to the *student* little further to desire; but a summary of modern practice which should comprise all the recent improvements, and exhibit, in a compendious form, the actual extent of our information, was still a desideratum to the *physician* engaged in the active duties of his Profession. With the exception of WELLER's Manual, translated by the late DR. MONTEATH, and the little compilation by Mr. WALKER, no attempt has hitherto been made to supply this obvious want; and to each of these there are objections which will ever prevent a republication in this country. The work first mentioned, though containing many excellent observations, and valuable as presenting a view of the state of Ophthalmic Surgery among our German brethren, has already become, in some measure, antiquated; while the other, from the extreme paucity of its details, appears to have been written rather as the medium for some ingenious speculations on the Physiology of the Iris, than with a principal design to practical utility. Under these circumstances, the present volume has been composed, with the expectation, in some degree, of supplying the deficiency. It has been the object of the author, to present the points of chief importance in the symptoms, causes, and treatment of each disease, with as much brevity and perspicuity, and at the same time, with as much minuteness, as the nature of the plan would permit; he has freely availed himself of the best sources of information; and the result of his labours is submitted to the Profession, in the hope, that though a small, it may not prove an unacceptable offering.

Philadelphia, December 9, 1836.

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TO THE SECOND EDITION.

THE republication of this little volume in England* is a sufficient proof of the general impression which was felt of the want of such a work; and this opinion has been still further manifested by the subsequent appearance in that country of several treatises on a plan somewhat similar. On this side of the Atlantic, nothing of the kind has since been attempted. The compilation of Dr. Frick of Baltimore, unknown to the writer at the date of his first advertisement, the more limited production of Mr. Wallace of New York, and the notes of Dr. Hays to the American reprint of the work of Mr. Lawrence, constitute indeed, with the present exception, nearly the whole of our formal contributions to this department of Surgery. The reasons which led to the preparation of the book in the first instance, consequently apply with equal force to the publication of a second edition. In revising it for that purpose, the author has endeavoured, while preserving its character as a *manual*, to enter rather more fully into detail than he had previously done; many parts have been entirely rewritten; and the hope is entertained that the additions which the advance of science and his own experience have enabled him to make, have rendered it more worthy of public favour.

Philadelphia, January, 1846.

* A Manual of the Diseases of the Eye; or Treatise on Ophthalmology, by S. Littell, M. D., one of the Surgeons of the Wills Hospital for the Blind and Lame, Fellow of the College of Physicians of Philadelphia, etc., etc. Revised and enlarged by Hugh Houston, Member of the Royal College of Surgeons, London: John Churchill, Princes Street, Soho. 1838.

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DISEASES OF THE EYE.

DISEASES OF THE ORBIT.

INFLAMMATION OF THE ORBIT.

INFLAMMATION of the orbit may originate either in the cellular membrane, the periosteum, or in the bones which contribute to the formation of that cavity; and exhibits the morbid terminations peculiar to the several tissues in which it is seated,—suppuration, thickening, exostosis, caries, &c. With a single exception, however, it will be quite unnecessary to enter into any detail on these subjects, since they can only be treated on the general principles applicable to similar affections in other parts of the body, and derive their importance from the proximity of the brain, rather than from their influence on the organ of vision.

Inflammation of the cellular tissue within the orbit is characterized by severe, deeply seated, and progressively increasing pain, headache, immobility of the globe, and a feeling of distension or pressure, arising from the swelling of the inflamed parts, which gradually protrude the eye so as to impart to it an unnatural prominence. This organ itself is not usually inflamed, but there is

more or less tumefaction of the palpebræ, intolerance of light, and an appearance as of scintillations; the lachrymal secretion is increased, the slightest motion of the globe is attended with acute pain, and vision, always impaired, is sometimes speedily lost altogether. In still more aggravated cases, the eye becomes inflamed, the lids enormously swollen, and the cornea, softened in its texture, ultimately yields to the pressure, and the humours are partially discharged. The constitutional disturbance is proportionate to the severity of the local symptoms; there is often acute inflammatory fever; and delirium—frequently indicating the extension of disease to the brain—is a common occurrence. If the inflammation be not arrested, suppuration, generally indicated by the usual symptoms, rigors, throbbing, &c., at length takes place, but is followed by no abatement of the pain; fluctuation may often be perceived, and the abscess approaches the surface at some point around the margin of the orbit, or between the palpebræ and the eyeball.

When the disease has become complicated with meningitis, it sometimes happens that the abscess bursts, and discharges an unhealthy secretion mixed with blood; which, however, in this stage of the malady, is rarely attended with any material remission of the symptoms. Even where this melancholy result is prevented, partial indurations of the cellular tissue remain, which give to the eye an abnormal position, and vision often continues weak, or is irrecoverably lost. Acute inflammation, unless caused by mechanical violence, is fortunately rare, though it does occasionally occur as an idiopathic affection, followed by caries, necrosis, ectropium, strabismus, and other unhappy consequences.

Treatment.—The urgency of the symptoms, and the danger of the inflammation extending to the parts within the cranium, call for the vigorous employment of depletory and other antiphlogistic measures, and render it necessary to evacuate the matter as soon as its existence is ascertained, though it may not have made sufficient progress to be felt through the integuments; fatal consequences having sometimes arisen from pressure upon the brain. When the abscess does not point externally, the opening should be made between the palpebra and the globe, and followed by poultices of flaxseed meal and warm fomentations. The lymphatic exudation, producing condensation of the cellular tissue, sometimes yields slowly to the influence of time and the persevering use of frictions with mercurial or iodated ointments.

Inflammation of a less vehement character is occasionally met with among weak and scrofulous children, in whom it generally appears without any obvious cause. It is sometimes complicated with disease of the lachrymal gland, and may be produced also by external violence. Mr. Mackenzie relates the case of an adult in whom the progress of the symptoms was so slow, that twelve years elapsed from the infliction of the injury, before the developement of a tumour, with obscure fluctuation, at the upper part of the orbit; the abscess was punctured, the discharge continued during the period of six months, the globe, which had been partially protruded, gradually resumed its position, and vision, at one time greatly impaired, was completely restored.

A congested condition of the adipose and cellular tissue of the orbit, communicating to the eye an unnatural

prominence, is sometimes observed in females; and may require, in addition to such measures as may be necessary for the restoration of suppressed or defective evacuations, the local abstraction of blood from the temples or nucha, and the exhibition of active cathartics. In other instances there appears to be an undue accumulation of adipose matter in the orbit; or the cellular tissue becomes indurated from inflammation, which, though chronic in its nature, is accompanied, notwithstanding, with severe pain and chemosis: cases are recorded in which the eye was protruded and destroyed from this cause, and it became necessary to remove the disorganized and hypertrophied parts with the knife.

TUMOURS.

Morbid growths of various kinds,—osseous, sarcomatous, encysted, medullary, and hydatid,—sometimes originate in the orbit, or make their way into that cavity from the neighbouring parts, distorting the globe in different directions, and producing displacement, varying in degree from slight projection to complete exophthalmus; and as, independently of their effects upon the organ of vision, they may occasion absorption of the orbital process, and thus produce fatal pressure upon the brain, they should, if practicable, be removed by an early operation. When their contents are fluid, a simple puncture may be sufficient for this purpose, the cyst becoming obliterated by the inflammation which it induces; but in other cases, an incision will be required, either through the integuments or conjunctiva, according to circumstances,—the former being prefera-

ble when the tumour is situated above the levator muscle, and does not extend far within the orbit. As a general rule, it should be in a direction parallel to the fibres of the orbicularis; but deviations are sometimes admissible, and Dr. Monteath found it necessary, in one instance, to make an incision perpendicular to the tarsal margin through the whole breadth of the eyelid. The tumour having been exposed, is secured by means of the tenaculum or ligature, and the dissection carefully performed with the common scalpel. When the morbid growth is large, and the operation is performed through the conjunctiva, it will be requisite, as a preliminary measure, to divide the external commissure of the lids. The globe generally resumes its proper position immediately after the removal of the protruding power; but if otherwise, slight pressure may be made upon it by means of an appropriate bandage; the edges of the wound should be carefully approximated, retained in apposition by suture or adhesive plaster, and the subsequent inflammation moderated by cold applications, leeches, and other suitable remedies.

Exostosis of the orbit sometimes arises from constitutional causes, and the primary indication consequently is the removal of the diseases—syphilis, scrofula, &c.—to which it owes its origin; after which, if the tumour continues to increase, is situated in the anterior part of the orbit, and the symptoms are urgent, it may perhaps admit of excision by means of the chisel and mallet. The removal of exostoses more deeply seated would require the previous extirpation of the eyeball,—an operation which can be justified only by extreme circumstances.

Medullary and fungous growths in the orbit are very

liable to reproduction; an event which, originating as they sometimes do in contiguous parts, may perhaps be explained by the almost necessary incompleteness of their removal. A melancholy case of malignant disease, in which, however, no operation either was, or could be performed, was treated a few years since, by the author. The patient, a native of Ireland, and a shoemaker by trade, was of medium stature, robust frame, and had been addicted to onanism. Violent pain in the temples and involving the whole head, sleeplessness, amaurosis, prominence of the eyes, and a copious secretion from the nasal cavities, were the principal symptoms. As the disease advanced the protrusion increased, the palpebræ were everted, a fungous excrescence could be felt in each nostril, and the globes, nearly ejected from their sockets and surrounded by the red, swollen, and infiltrated conjunctiva, exhibited a sad and revolting spectacle. The patient eventually died in a comatose state, and the autopsy revealed a firm, irregular tumour, projecting from the base of the cranium into the sulcus between the anterior and middle lobes of the brain. It arose apparently from the body of the sphenoid bone, and extended an inch or more in a direction upwards and backwards, pressing upon the optic nerves at their junction, and reaching, on the right side, as far as the surface of the pars petrosa. The delicate laminæ of the ethmoid, still further attenuated by absorption, were situated in the centre of the diseased mass, and entirely involved by it; the cribriform plate was absorbed in its posterior margin to a considerable extent, as were likewise the orbital plates of the os frontis;—the whole presenting a sharp, jagged, and irregular outline. The ramifications of the morbid pro-

duction, which, in the aggregate, were equal in size to a small orange, extended into the orbits, and, occupying the nasal cavities also, projected below to the level of the inferior turbinated bone. The consistence of the tumour varied in different parts: above, and where it was connected with the pars petrosa of the temporal bone, it was firm, semi-cartilaginous, and of a whitish colour; beneath the cribriform plate it was of softer texture, and in several places presented a medullary or encephaloid appearance; while the inferior division, which occupied the nares, was of intermediate density, and not unlike a polypous excrescence. The disease was nearly a twelvemonth in its progress, and though the precise spot in which it originated is shrouded in obscurity, it was deemed, both by the author and his friend, Dr. Parrish, who kindly assisted in the examination, most consonant with all the circumstances of the case to refer it to the sphenoidal or posterior ethmoidal cells.

The affection known under the name of aneurism by anastomosis, sometimes has its seat within the orbit, and is recognised by pain in the eye and head, accompanied with a throbbing, rushing, or thrilling sensation, which is communicated to the hand of the observer, humming in the ears, and protrusion of the eyeball. Its effects upon the organ of vision are often very serious,—inflammation ensues, pus is effused within the globe and between the lamellæ of the cornea, sloughing or ulceration follows, and the humours are discharged. The application of a ligature to the carotid artery of the affected side is the only remedy; and instances are recorded by Messrs. Travers, Dalrymple, and others, in which this expedient was successfully adopted.

WOUNDS OF THE EYE AND ITS APPENDAGES.

INJURIES OF THE EYELIDS.

THE parts around the eye are liable to contusions, fractures, and wounds of every description; but as they require the same treatment as similar accidents occurring elsewhere, modified only by their influence upon the brain, it is unnecessary to treat of them in detail. All extraneous substances should of course be removed, and such measures employed as will tend most effectually to prevent the accession of inflammation, or arrest it when it has already taken place. In wounds of the eyelids the utmost care should be taken to replace the parts and preserve them in accurate adjustment, and for this purpose it may be necessary to make use of one or more very fine sutures, in addition to the aid which may be derived from court or adhesive plaster; taking care to remove them at an early period, in order to avoid any marks or irritation they might otherwise produce. The application of a fold of linen moistened with cold water, and the usual antiphlogistic measures employed with an activity corresponding to the severity of the inflammatory symptoms, constitute all that it is requisite to add respecting the treatment. When the lid is extensively lacerated, the importance of the part will suggest the propriety of adopting every means to cherish its vitality and promote reunion.

Ecchymosis from contusion is a common occurrence,

and besides the use of remedies adapted to allay irritation, may require the employment of measures to promote the absorption of the extravasated fluid. If the effusion is more considerable, the part swollen and tense, and the blood uncoagulated, it may be evacuated by a puncture with the lancet. In consequence of the quantity of loose cellular tissue which enters into the composition of this part, the inflammation following contused wounds is very liable to terminate in suppuration, and when this is inevitable, it should be accelerated by poultices, and the matter discharged by an early opening.

Injuries of the frontal nerve after its exit from the supra-orbital foramen, are said to be not unfrequently followed by amblyopia, and occasionally by complete amaurosis; for the relief of which Beer confidently recommends the complete division of the nerve—an expedient, however, which appears to have been less successful in the hands of others. Under such circumstances, a cure has sometimes been accomplished through the agency of galvanism or electricity.

Scalds and burns, if they are superficial, generally heal readily under the influence of remedies calculated to abate inflammation; but when they are so deep as to produce disorganization of the integuments, great caution is required to prevent ectropium, and other consequences of so grave an injury. In a case admitted into the Wills Hospital, where the globe was completely denuded from this cause, the lower lid destroyed, and the upper eyelid adherent throughout to the orbital margin, the author was induced by the earnest solicitations of the patient, a handsome young female,—to whose decision, the opinion of his colleagues being divided, the question had been

referred—to perform, contrary to his own judgment and advice, an operation for the removal of the deformity. The palpebra, separated from the parts to which it adhered, was brought down so as to cover the eye, various measures were employed to promote cicatrization and resist contraction, and there appeared to be, for several weeks, a fair prospect of partial success; but as the wound healed, the granulations shrunk, and the lid, notwithstanding every exertion to prevent it, reverted nearly or quite to its former position. The case was remarkable for the integrity of the eyeball, which, though several years had elapsed since the accident, had been preserved in a moist and healthy condition by a covering of linen spread with simple cerate.

WOUNDS OF THE GLOBE.

The delicate structure of the eye, and its exposed situation, render it liable to suffer from external violence, the consequences of which are either primary,—the direct result of the injury; or secondary,—depending upon the alterations produced by the subsequent inflammation. The effects of such accidents, rarely confined to a single tissue, are felt more or less by all, and some of them, as penetrating wounds of the orbit, and those causing fracture of the orbital plates, are more immediately important from their influence upon the brain. They differ, moreover, as they are occasioned by chemical or mechanical agency. The most common, are wounds of various kinds,—punctured, lacerated, or incised,—whether inflicted accidentally, or in the performance of surgical operations; contusions; and inju-

ries from boiling water, or steam, melted metals, lime, the mineral acids, the explosion of gunpowder, &c., &c. The blood, which, in some of these injuries, is effused into the anterior chamber, is in itself a matter of little moment, being generally soon absorbed after the vascular excitement has subsided. The action of heat is, in most cases, very serious, not only producing vesication and ulceration of superficial parts, but often occasioning intense inflammation, which, extending to the more deeply seated textures, involves the entire globe, and requires the most energetic treatment for its reduction. The same remark is applicable to caustic substances, as lime, &c., which frequently produce partial disorganization of the tissues to which they are applied, and give rise to ophthalmia of a very intractable character. In all these cases, after the removal of the offending cause, attention should be chiefly directed, by the employment of rigid antiphlogistic measures, to prevent or repress undue vascular excitement, a certain degree of which, it should be remembered, is necessary for the reparative process. In the performance of surgical operations, when the patient has been previously prepared by a restricted diet, saline laxatives, and, in plethoric habits, by venesection, and where active treatment is adopted on the first appearance of inflammation, it rarely proceeds so far, in healthy constitutions, as materially to injure the eye; but, under other circumstances, the best-directed exertions may be unavailing to preserve the integrity of the organ.

Violent blows sometimes produce rupture of the cornea, followed by prolapsus of the iris; more frequently the sclerotica is lacerated, and this may happen without lesion of the conjunctiva; or the choroid and

retina may be separated from their connexions and otherwise injured, the external tunics preserving their continuity. In other instances the effects of the contusion appear to be chiefly expended upon the contents of the globe; occasioning dislocation of the crystalline, disorganization of the hyaloid membrane, and distortion or displacement of the pupil, the result of paralysis of the ciliary nerves. Amaurosis is a frequent sequel of such accidents, and may likewise be caused by the irritation of foreign substances which have penetrated within the eye; injuries of either kind are sometimes followed by atrophy of the eyeball, the consequence of the destruction of its secretory functions by the subsequent inflammation. The presence of extraneous bodies, especially when they are large and angular, is commonly indicated by an irritable and congested condition of the part, often affecting sympathetically the healthy organ. Cataract is also a common occurrence.

Dislocation of the globe is a much more serious event, the muscles being more or less extensively lacerated, and vision, though sometimes preserved under the most unpromising circumstances, often entirely destroyed. The protruded organ should be replaced with as little delay as possible, and appropriate measures adopted to obviate the consequences of so grievous an injury. Its replacement may be facilitated by depressing the lower lid, and, if necessary, by dividing the external commissure,—a soft compress being applied to retain it in its proper position. Where much time has elapsed, and the swelling presents an insuperable obstacle to the reduction of the eye, it will be proper to wait until the tumefaction has in some measure subsided, under the

employment of venesection, leeches, &c., when, if the muscles have not been generally ruptured, it will often spontaneously recede.

Mr. Houston, the English editor of this little volume, publishes the following case, communicated by Dr. Ryan, to whom the work is dedicated, in illustration of the importance of immediate replacement of the eye.

"Captain —, aged fifty, on returning to his lodgings, on a very dark evening, tripped against the scraper near the hall door, and in falling had the globe of the eye dislodged by the hook of an old-fashioned window-shutter.

"The eye hung down upon the cheek; the patient applied to a surgeon of the old school, who proposed to detach it by incision, to which the patient would not submit. The eyeball was then replaced in its ordinary position, cold applications were assiduously applied, and when the acute inflammation was abated, cold water was applied five or six times daily for several weeks. Vision gradually returned, and at the end of six years, it was as perfect, according to the statement of Captain —, as it had been before the accident."

Blood effused beneath the conjunctiva, in consequence of local injury, is ordinarily absorbed as the inflammatory action disappears; but if it be deemed necessary to accelerate that process, any gently stimulating or astringent application may be employed for the purpose. Burns should be treated in the first instance by some tepid collyrium, as warm water alone, or with the addition of a small quantity of the *vinum opii* and *liquor plumbi subacetatis*. If the mischief is considerable, general and local depletion, saline laxatives, &c., will also be indicated; and, as already stated, the utmost

care will be required to guard against the extension of inflammation to the more deeply seated tissues. When the heat has been so intense as to injure the texture of the conjunctiva, granulations arise from the inflamed cellular membrane, and adhesions are apt to form between the palpebræ and the globe. To prevent such an occurrence, it will be proper to divide any recently formed bands, and to apply the nitrate of silver, in substance or strong solution, to the denuded surface of the lids.

When a foreign body, as a shot, or a particle of metal, has actually entered the eye—an injury which is often attended with impairment or loss of vision—it would be obviously improper to institute any measures for its removal, unless it were in the anterior chamber, or otherwise so situated as to be visible; in which contingency, should it threaten to give rise to much irritation, it might be readily extracted by means of the forceps or a blunt hook, through a small incision in the cornea. Such substances, when they are of a nature capable of being acted upon by the aqueous humour, are generally removed through the agency of that fluid; and when this does not happen, it has sometimes occurred that lymph has been thrown out around them, and they have remained encysted for years without occasioning any inconvenience,—this termination, however, only takes place when the particle is small, and lies at the bottom of the anterior chamber. In other cases, where an angular body, a piece of metal, for example, is driven into the eye, severe inflammation is produced; and though the violence of the symptoms may be subdued, a congested state of the organ remains, liable to occasional excitement, and occasioning

sympathetic irritation of the sound eye, which requires for its preservation the removal of the offending matter, or, if this cannot be immediately accomplished, the evacuation of the humours through a free incision of the cornea.

WOUNDS OF THE CONJUNCTIVA.

Wounds of the conjunctiva, with loss of substance, are generally attended with little danger, but when the portion of that membrane which covers the cornea has been injured, vision is often temporarily impaired by the resulting opacity. In cases where the conjunctiva scleroticæ is extensively lacerated, a very fine ligature may be required to retain the divided parts in apposition; care being taken to remove it as soon as it has accomplished the object intended.

WOUNDS OF THE CORNEA.

Slight injuries of the cornea in persons from any cause predisposed to inflammation, are often productive of serious consequences, and usually leave cicatrices more or less opaque. Walther states, that in a small district of Germany, fifty or sixty eyes are annually destroyed from wounds inflicted by the heads or beards of grain; and similar accidents are not uncommon during the harvest season in our own country. When the superficial lamina only is wounded, a cure is, in general, easily effected; but deeper injuries are often accompanied with protrusion of its interior lining, constituting what has been called hernia of the cornea.

Penetrating wounds are followed by the escape of the aqueous humour, and unless the opening is very small, prolapsus of the iris is not an unfrequent consequence,—the part thus protruded frequently contracting permanent adhesions to the orifice, and, in greater degrees of injury, the whole iris becoming adherent to the inner surface of the cornea. The aqueous humour is speedily reproduced after the closure of the wound, and no particular treatment is required, except that which may be necessary to avert or subdue inflammation. Both eyes should be closed and covered by a fold of linen confined by a bandage around the head, in order to support the parts, obviate friction between the edges of the wound and the palpebræ, and prevent the suffering organ from being sympathetically influenced by the movements of the other. The extract of belladonna, reduced by water to a state of semifluidity, should be freely applied around the brow, in order to preserve the circular outline of the pupil, and prevent the adhesions which are apt to form between the iris and the cornea. If the iris protrudes, it may be proper to assist its retraction by friction over the closed lid, and sudden exposure to a bright light, or by repressing it gently with the blunt extremity of a probe; but these manœuvres, which are often unsuccessful, should not be continued to the extent of producing pain and irritation. If the protrusion is large, and has the appearance of a bag containing aqueous fluid, a slight puncture at the most prominent part, with a cataract needle, will, in some instances, enable the iris more readily to resume its normal position. Appropriate measures should be adopted in all cases, to moderate the inflammatory symptoms; and if, after their removal, the prolapsus

continues, it should be touched, at intervals of one or two days, with a pointed cylinder of the nitrate of silver, or, previously to such application, the protruding portion, if considerable, may be excised with the curved scissors. The restorative powers of nature are often strikingly displayed in accidents of this kind, and much less mischief results, even from complicated injuries, when properly treated, than might reasonably have been apprehended.

Foreign substances, as particles of coal, metal, &c., sometimes adhere to the surface of the cornea, or are arrested in the substance of that membrane; and frequently produce acute suffering. They may, in most instances, be readily withdrawn by the forceps, or detached with a cataract needle or any convenient instrument; but if this cannot promptly be done, it will generally be better to wait till they have become loosened by ulceration, rather than incur the risk of aggravating the inflammation by injudicious efforts for their removal. When they have passed entirely within the anterior chamber, and are of such magnitude and probable consequence that an operation is deemed advisable, a puncture may be made near the margin of the cornea, and the offending body extracted by a small hook or forceps, as directed under the preceding head.

WOUNDS OF THE SCLEROTICA

Are generally attended with serious injury to the parts which that membrane is designed to protect, and are not unfrequently followed by intense ophthalmitis. It is sometimes penetrated, near the margin of the

cornea, by a shot, piece of stone or metal, and distortion of the pupil is produced from lesion of the ciliary nerves. It is occasionally ruptured by the violence of a blow, the conjunctiva remaining entire or otherwise; and internal extravasation, dissolution of the hyaloid membrane, concussion of the retina, and amaurosis are almost invariable consequences. There is, of course, little prospect of preserving vision in such cases, and it often happens that suppuration can be averted only by the most active antiphlogistic treatment. By some writers reunion is said never to take place after wounds of the sclerotica, but this is contrary to what we should, *a priori*, have anticipated, and is, moreover, contradicted by daily experience.

WOUNDS OF THE CHOROID.

The choroid membrane and ciliary ligament are liable to injury from blows and penetrating wounds of the globe; and the lesion, frequently ending in iritis and displacement of the pupil, is more immediately followed by extravasation of blood, which, however, is, in general, soon reabsorbed. In the case of a patient admitted into the Wills Hospital, rupture of the ciliary or choroidal vessels had been produced by contusion, and blood was effused, occupying the anterior chamber, and even distending the globe. No change in the appearance of the eye being perceptible after the lapse of many weeks, notwithstanding the use of appropriate measures to accelerate absorption, the cornea was punctured, and exit given to a large quantity of thin sanguineous fluid. The operation was followed by temporary collapse of

the eyeball, indicating dissolution of the hyaloid membrane; but the vacuum was speedily refilled, and the organ presented the same appearance as before.

WOUNDS OF THE RETINA.

When the delicate structure of the retina is considered, it will not appear surprising that vision should frequently be impaired, or altogether destroyed by contusions and other injuries. In some instances there is no perceptible alteration in the appearance of the organ, except, perhaps, more or less deviation from the normal condition of the pupil, and the amaurosis is probably occasioned by concussion or rupture of the retina; while in others blood is effused, with laceration of the sclerotica, and extensive disorganization of the internal parts of the eye; often followed, after a brief interval, by severe inflammation.* Nausea and emesis are common consequences of such lesions. The prognosis will vary, of course, according to the circumstances of each particular case: in those last mentioned, recovery is hopeless; but slighter degrees of injury, accompanied with partial amaurosis, may sometimes be successfully treated, if assistance be obtained soon after their infliction; though it not unfrequently happens that permanent blindness is produced by causes which would scarcely

* The author has, at this moment, under treatment in the Wills Hospital, a woman, both of whose eyes have, at different periods, been struck by a cork suddenly extricated from a porter bottle. Incomplete amaurosis, with oscillation of the iris, indicating disorganization of the hyaloid membrane, exists in each organ, and in addition to this, incipient cataract is present in one, while the lens, surrounded by its capsule and partially opaque, is dislocated in the other.

be deemed adequate to such an effect. Venesection, the local abstraction of blood by leeching or cupping, and mercury, are the proper remedies, and should be employed, subordinately to the degree of constitutional vigour, with a freedom proportionate to the intensity of the inflammatory symptoms and the importance of the injured organ. Atrophy of the globe is not an unusual sequel; and it has also been observed, that when vision is thus destroyed in one eye, the other is liable to suffer from sympathetic irritation, sometimes terminating in complete amaurosis: by proper management—leeching, or cupping, a restricted diet, repose of the organ, &c.,—this melancholy result may often be averted. Punctured wounds of the retina, and pressure from a lens displaced in the operation of couching, are occasional causes of amaurosis, and indicate the expediency, in every instance, of adopting all proper precautions to prevent such an occurrence.

WOUNDS OF THE IRIS.

The iris is sometimes partially separated from its ciliary connexions by a fall or blow, and an adventitious aperture is thus produced, which may give rise to much inconvenience, from its interference with the natural pupil. The newly-formed opening is, in general, soon obliterated; but when this does not happen, and the confusion of vision is very considerable, it has been proposed to divide the intervening portion of the membrane, and thereby unite the two orifices,—an expedient which might abate, though it would not remove the difficulty, inasmuch as there would still be a want

of correspondence between the pupils of the two eyes. Foreign bodies which have penetrated the eye, sometimes lodge in, or against the iris; but no interference is generally required, unless they are large and produce much irritation, when they may be removed through a small incision in the cornea. The pressure of a dislocated, or partially absorbed crystalline, frequently excites iritis; and in one instance, where the remains of a lens, which had been depressed more than a year before, had risen and found its way into the anterior chamber, occasioning pain, and threatening mischief to the organ, a manœuvre was successfully tried for its dislodgment, after several other abortive attempts, which may perhaps be attended with a like fortunate issue in similar cases, and thus obviate the necessity of puncturing the cornea. The pupil having been previously dilated by means of belladonna, the patient was placed in a supine position, with his head depending over a chair, and the blunt extremity of a probe being applied with gentle pressure above the irritating body, it yielded to the force employed, and immediately repassed into the posterior chamber. Partial disappearance or obliteration of the iris, in consequence of lesion of the ciliary nerves, is not an unfrequent occurrence, the pupil deviating from its natural situation in the centre, and extending, on the injured side, to the circumference of the membrane. The aperture, under such circumstances, approaches to an oval form, and is capable, in some instances, of contraction and dilatation; vision, though impaired, is often preserved in a very useful degree, and the defect, which is permanent, is probably dependent upon absorption of the substance of the iris.

Inflammation of the iris usually terminates in extra-

vasation of lymph, producing adhesion to the capsule of the lens, and obstruction, or occlusion of the pupil; and wounds of this part must be treated, therefore, on the general principles of preventing, or arresting that process, and obviating the contraction of the circular fibres. The whole antiphlogistic system—bleeding, leeching, active catharsis induced by the sulphate of magnesia and infusion of senna, a restricted diet, &c.—will be necessary in some cases. The patient should be confined to a darkened apartment, belladonna applied to the brow, and mercury promptly administered with a view to its alterative and sorbefacient action. The blood, which, in penetrating wounds of the iris, is often effused into the chambers of the eye, is generally removed after the inflammatory symptoms have subsided, —the action of the absorbents being impaired or suspended altogether during the continuance of acute phlogosis. Instances in which the texture of the membrane has been much lacerated, or otherwise injured, are frequently followed by amaurosis; but this doubtless arises, in part, from the simultaneous lesion of other tissues. The treatment of prolapsus of the iris has been sufficiently described under the head of wounds of the cornea.

WOUNDS OF THE CRYSTALLINE AND CAPSULE.

Opacity of the lens is the usual consequence of wounds or rupture of the capsule; but when this envelope, otherwise uninjured, is detached from its vascular connexions with the ciliary processes, it frequently retains a degree of semi-transparency. In this condition

it becomes a foreign body, and either floats loosely in the eye, or is retained *in situ* by the adhesion of the posterior hemisphere of the capsule to the hyaloid membrane. The symptoms attending these dislocations, complicated, as they often are, with dissolution of the vitreous humour, and lesion of the other tissues, vary according to the severity of the injury, individual susceptibility, &c. They are often followed by general inflammation of the organ, accompanied with intense pain and hemi-crania, requiring free depletion, with other antiphlogistic measures, and the application of belladonna to the brow. Vision is generally impaired or destroyed by the violence of the injury; and there being, in the latter event, little hope of its restoration, the employment of remedies should not be carried so far as to enfeeble the constitution of the patient, and thus produce evils greater than those which they are intended to relieve. When the capsule is ruptured, the opaque lens, subjected to the action of the aqueous humour, is gradually absorbed, especially in early life, and membranous cataract is the result. In those cases where the dislocated crystalline presses against the iris, or has passed into the anterior chamber, occasioning, as it sometimes does, great irritation, the pupil should be dilated by means of belladonna, and if this fail to give relief, the lens should be removed, through a small incision in the cornea. Wounds of the capsule, whether inflicted by penetrating instruments, the explosion of gunpowder, or other agencies, are followed, as above stated, by opacity of the lens, and under such circumstances an event frequently occurs beautifully illustrative of the remedial powers of nature, exerted in removing parts no longer of use in the animal economy: the aqueous humour

gaining admission through the opening, absorption of the crystalline commences, and gradually progresses, with restoration of vision, to the complete removal of that body,—the cause of the injury thus preparing the way for the reparation of the mischief which it has occasioned.

WOUNDS OF THE HYALOID MEMBRANE

Are necessarily accompanied with serious lesion of the investing tunics, from which indeed they derive their chief importance. They are usually followed by partial evacuation of the vitreous humour, and impairment, or loss of vision,—results which are also sometimes consequent upon the removal of cataract by extraction.

DISEASES OF THE LACHRYMAL ORGANS.

INFLAMMATION OF THE LACHRYMAL GLAND.

Dacryadenitis.

THIS disease, which is of very rare occurrence, is chiefly observed in children of strumous constitutions, and may arise either idiopathically, or by the extension of inflammation from the neighbouring parts. It is ordinarily caused by exposure to cold, and commences with a sensation of dryness in the eye, and pain and swelling of the gland. The globe is displaced in a direction downwards and inwards, its mobility is impaired, and in the advanced stage it is sometimes almost concealed by the cellular infiltration. The upper eyelid becomes swollen, tense, and extremely sensitive to the touch; and the pain increasing, is felt throughout the head, but is particularly severe in the temple and over the brow. The conjunctiva participates in the inflammation; fever and delirium are not unfrequent concomitants; and the disease, if not arrested, terminates in suppuration. The opening through which the matter is discharged sometimes becomes fistulous—an occasional result also of penetrating wounds of the gland—and in vitiated habits often evinces little disposition to heal. The inflammation in its progress may likewise involve the periosteum, producing caries of the bone, and, as in all similar affections of this vicinity, there is some danger of its extension to the brain. Closure, or atony of the excretory ducts of the gland, and accumulation of fluid in its substance, are also occasional sequelæ.

There is a chronic form of the complaint, attended with enlargement of the gland, a sense of fulness rather than of pain, and more or less constraint in the movements of the eyeball; the tumour, which has a lobulated surface, and sometimes attains a considerable magnitude, may either remain stationary for a time, or terminate in the imperfect suppuration peculiar to scrofula.

Treatment.—In the acute stage, local depletion, saline aperients, and refrigerating lotions are the proper remedies. When, notwithstanding all our efforts, suppuration is about to take place, it should be promoted by means of poultices and fomentations, and the matter evacuated without unnecessary delay, through a puncture beneath the eyelid. Frictions with mercurial or iodated ointments may be employed to disperse any induration that remains after the part has healed.* Should the opening made for the escape of the matter continue fistulous, the occasional introduction of a bougie, or the use of gently stimulating injections, may be tried, and when there is no remaining disease, its closure accelerated by touching the orifice with a pencil of the nitrate of silver.

The preceding measures, less actively employed, together with the alterative use of iodine, the sulphate of quinine, the precipitated carbonate of iron, exercise in the open air, and other measures calculated to invigorate the system, constitute the appropriate treatment for the chronic form in which the inflammation sometimes appears.

In regard to the frequency of this disease, there is a

* R. Hydrarg. ioduret. gr. v.; adipis, ℥iij.; morphinæ acctat. gr. j. Misc. R. Potassæ hydriodat. gr. x.; adipis, ℥ss.; morph. acctat. gr. j. M.

wide discrepancy of opinion; by some writers—Schmidt, Stoeber, Todd, and others—it is described as of common occurrence; while Beer states that it is very rare, Middlemore that it has seldom fallen under his observation, and Mr. Lawrence has never seen it either in its acute or chronic form.

SCIRRHUS OF THE LACHRYMAL GLAND.

A chronic enlargement of the lachrymal gland, accompanied with induration, and a lobulated condition of surface, has been described as a cancerous affection; but there seems reason to doubt whether it is really malignant. The tumour, when incised, displays a firm, homogeneous, and even striated texture, but is said not to possess the cartilaginous hardness of scirrhus; and differs, moreover, in that it does not become adherent to the surrounding parts, undergo ulceration, affect the lymphatic system, or return after extirpation; it is most frequent, also, in persons of strumous diathesis. There are, however, several points of resemblance,—it rarely occurs before the middle period of life, the pain is severe and elancinating, and since, if allowed to increase, it produces serious consequences, by pressure upon the adjacent parts, it may, for all practical purposes, be regarded as cancerous.

While the tumour is small and remains stationary, which ordinarily it long continues to do, interference, except to mitigate symptoms, invigorate the system, and change the action of the part, by the exhibition of alteratives, would be obviously improper; but when it acquires such magnitude as to compress the eye, and

threaten mischief to the brain, recourse must be had to extirpation. It was formerly believed that the excision of this part involved also the necessity of removing the globe; but later observations have proved that this is not the case,—the presence of the gland not being essential to the performance of the functions of the eye.

Operation.—An incision having been made down to the tumour, through the integuments and parallel to the margin of the orbit, an assistant separates the edges of the wound, and the surgeon, drawing forwards the gland with a tenaculum, carefully dissects it from its connexions by means of the bistoury or scissors; great care being taken to avoid injury to the brain or eye. In smaller tumours M. Velpeau divides the external commissure, everts the lid, and removes the gland through an incision in the conjunctiva. The subsequent treatment must be conducted on general principles.

ENCYSTED TUMOUR OF THE LACHRYMAL GLAND.

Under the title of hydatid of this organ, Schmidt and others have described a rare disease, which, by most writers is attributed to effusion of the lachrymal secretion into the cellular tissue uniting the lobules of the lachrymal gland,—an explanation, however, which is not very satisfactory. It advances with such rapidity as to attain its full developement in the space of a few weeks, and is accompanied with corresponding intensity of symptoms;—pain in the orbit, obtuse, tensive, and deeply seated; prominence and immobility of the eye, impairment and disturbance of vision; a sensation as of scintillations or flashes of light; hemicrania; and, as

the disease advances, displacement and protrusion of the globe, amaurosis, sleeplessness, and high constitutional disturbance. Some degree of hardness and resistance may be felt in the lachrymal region; but the tumour, from its situation, is not readily perceptible, and its character can only be inferred from the rapidity of its progress. If relief is not soon obtained, it sometimes terminates in apoplexy, and at others more slowly in inflammation and suppuration of the eyeball.

The treatment consists in making a puncture or incision into the tumour from beneath the lid, or, if this cannot be everted, through the integuments; and the operation should be performed as soon as the nature of the case is ascertained, in order to relieve the sufferings of the patient, and prevent the consequences of pressure upon the surrounding parts.

It occasionally happens that one of the lachrymal ducts becomes dilated near its termination, and a circumscribed elastic swelling is formed, in which, when the lid is everted, fluctuation can be detected. It is unattended with pain, and from its superficial position, immediately below the conjunctiva, is easily distinguished from the encysted tumour of the orbit; but the error would be of little moment, inasmuch as the treatment is in both cases the same.

EPIPHORA—STILICIDIUM.

When the lachrymal fluid is secreted in undue quantity, the redundant tears flow over the cheek, constituting the complaint called epiphora; the same effect is produced by various diseases of the excretory apparatus,

and is then termed *stillicidium lachrymarum*. The lachrymal secretion is increased by every chemical or mechanical irritation of the conjunctiva, and epiphora is consequently a usual attendant on all inflammations of the eye and its appendages.

Being the result of an irritable condition of the lachrymal gland, it occurs also in connexion with the exanthematous affections—measles, scarlet fever, small-pox, &c.,—disappearing, in most cases, with the disease, of which it is only a symptom. It is especially common in strumous ophthalmia, and may arise also from dentition and intestinal irritation. Eversion of the lids, imperforation of the nasal duct or lachrymal canaliculi, occlusion of the puncta, and an atonic or patulous condition of those orifices, are the ordinary causes of *stillicidium*.

Treatment.—As a mere symptom of ophthalmia, epiphora requires no particular treatment, but when it occurs as an idiopathic affection, depending upon a morbid state of the gland, leeches, followed by the application of a blister to the temple, are the appropriate remedies. If it arises from irritability of the conjunctiva, a weak solution of the nitrate of silver dropped upon the eye once a day, will be found useful; the *vinum opii* may be employed for the same purpose, or the organ may be exposed to the vapour produced by adding a drachm of laudanum to a cupful of boiling water; and where there is any derangement of the meibomian secretion, the red precipitate, in the proportion of eight or ten grains to the ounce of lard, or the citrine ointment greatly reduced, should be applied to the edges of the lids at night. When it is induced by sympathy with some remote part, as gastric or intestinal irritation

from disordered digestion, worms, &c., attention should be directed to the removal of the cause, and the improvement of the general health. Occasional purging with calomel combined with the compound extract of colocynth, aloes, or rhubarb; anthelmintics, &c.; are indicated under such circumstances. In the strumous constitutions in which it so frequently appears, the sulphate of quinine, the carbonate of iron, the warm bath, exercise, &c., will often prove serviceable.

An opposite condition, known under the appellation of

XEROMA,

Or dryness of the eye, has sometimes been noticed as a symptom in chronic enlargement of the lachrymal gland, and not unfrequently accompanies the incipient stage of amaurosis and various inflammatory affections of this part. It occurs also as a nervous or sympathetic phenomenon, and may likewise arise from partial obliteration of the excretory ducts of the gland. The secretion from the conjunctiva takes place as usual, the surface of that membrane is clear, moist, and altogether unchanged in appearance, but the patient complains of dryness, and a sensation as of sand or dust beneath the lids. When it is caused by obstruction of one or more of the secretory ducts, those which remain pervious dilate sufficiently to supply the defect, and the uncomfortable feeling may be, meanwhile, alleviated by the frequent use of tepid water, or some mild mucilaginous collyrium. Surgical treatment, if any thing further is necessary, must be guided by the nature of the cause.

There is an affection sometimes described under the

same title as the foregoing, in which the secretory function of the conjunctiva is destroyed, and the membrane acquires more or less of the cuticular character. It appears to be the result of chronic inflammation, and is accompanied by various morbid changes—partial symblepharon, obliteration of the puncta lachrymalia, trichiasis, &c. Being a disease of the conjunctiva, it will be more fully noticed in another section of the work.

OBSTRUCTION OF THE LACHRYMAL CANALICULI.

When only one of the lachrymal canals is obliterated, compensation is generally made by the increased activity of the other; but where they are both imperforate, the case is irremediable. They are sometimes temporarily obstructed by mucosities, or tumefaction of the lining membrane, the result of inflammation originating primarily in the neighbouring parts; and occasionally the difficulty exists more immediately in the puncta, which are either unduly irritable and contracted, or atonic and patulous,—the latter condition being sometimes induced by the too frequent use of the probe or syringe.

The treatment consists in the removal of inflammation by the application of leeches near the inner canthus, and blisters to the temple or behind the ear; the restoration of the passage by an anelion probe or syringe, when stricture or inspissated mucus is the cause of the obstruction; the abatement of irritability by the occasional use of a solution of nitrate of silver; and the employment of gentle stimuli, as the *vinum opii*, an ointment of red precipitate in the proportion of eight or

ten grains to the ounce of lard, or collyria of the sulphates of copper, zinc, &c., in the atonic or dilated state of the puncta.

It sometimes happens that the canals are obstructed by a calcareous deposition from the tears; and a wandering eyelash now and then finds its way into one of the puncta, inducing irritation, which however rapidly subsides on its removal.

ACUTE INFLAMMATION OF THE LACHRYMAL SAC.

Dacryocystitis.

Inflammation of the lachrymal sac is recognised by a hard, circumscribed, and sensitive tumour, immediately below the tendon of the orbicularis muscle; the eyelids are slightly swollen in the incipient stage of the complaint, and the skin covering the sac somewhat red and inflamed; as the symptoms advance, the tumour acquires a brighter red, or even a livid colour, and the redness and swelling extending to the surrounding integuments imparts to them an erysipelatous appearance. The pain, deeply-seated, obtuse and elancinating in the commencement, becomes acute, tensive, and throbbing; the tumefaction, towards the inner canthus especially, is so considerable as almost to conceal the eye, and the immediate neighbourhood of the part is exquisitely tender to the touch; the lachrymal canaliculi and nasal duct, rendered impervious by the congestion of their lining membrane, no longer perform their office; the patient complains of agonizing headache, and, owing to the confined situation of the tissues, the fever and constitutional disturbance generally, are more considerable than

might have been anticipated from the diminutive size of the inflamed organ. Suppuration ensues, with little abatement of suffering, or the secretion from the inner surface of the sac becoming puriform, and unable to escape through either outlet, accumulates in its cavity; the tumour enlarges, becomes tense and shining, with evident fluctuation, and the matter is discharged through an opening in the integuments formed by sloughing or ulceration. The inflammation now usually subsides, the aperture gradually contracts, and the tears resume their course to the nose; but in aggravated or neglected cases, permanent obstruction of the duct from lymphatic deposition is not an uncommon sequel,—the secretion from the sac, mingled with the lachrymal fluid, continuing to be discharged through a fistulous orifice. The disease generally occurs in persons of strumous or lymphatic temperament; and exposure to cold, catarrh sporadic or epidemic, variola, and the other exanthemata, are the ordinary exciting causes.

Treatment.—Venesection, the application of leeches over the sac, saline purgatives, and the usual antiphlogistic remedies, employed with an activity proportionate to the severity of the symptoms, constitute the principal part of the treatment. Fomentations with a sponge wrung out of warm water or any anodyne decoction, poultices of flaxseed meal, &c., are the best local applications; and to allay pain and procure rest, a full dose of morphia should be exhibited at night. The formation of matter is generally indicated by a soft white, or yellowish point, and the abscess may either be allowed to find its way to the surface, or an opening may be made with a bistoury or lancet, introduced below the tendon of the orbicularis, which ought to be rendered prominent

by an assistant standing behind the patient and drawing outwards the external commissure of the lids. The poultice should now be reapplied, the fomentations continued, and the sac, after a time, occasionally syringed with warm water. Some practitioners recommend the immediate introduction of a probe to explore the cavity, or restore the permeability of the passage; but even if this were not precluded by the extreme sensibility of the parts, it would be much more prudent to endeavour by soothing measures to allay the inflammation, which often continues in the membrane after all external traces of it have disappeared, and defer any attempts of this kind until the irritation has entirely subsided. Should the discharge continue, and threaten to become chronic, the wound may be dressed with the red precipitate ointment,* and a weak solution of the sulphate of copper and zinc, or the nitrate of silver, dropped into the inner canthus, or injected through one of the puncta by means of the anelien syringe. Occasional aperients, a regulated diet, the internal exhibition of quinine or the carbonate of iron, the warm-bath, and other measures adapted to improve the general health, will also be useful under such circumstances.

CHRONIC INFLAMMATION OF THE LACHRYMAL SAC.

In this tedious affection, which, in cachectic individuals, may either occur idiopathically, or as a sequel of the acute form, the inflammatory symptoms are of a much milder character. A tumour appears at the nasal

* R. Hydrarg. oxid. rub., gr. viij-xii.; adipis, ppt., 3j. Tere oxidum in pulverem subtilissimum, dein adde adipem.

angle of the eye, occasioned by the tears and the secretion from the lining membrane accumulating within, and distending the sac. It is accompanied with dryness of the nostril and stillicidium; and may be either indolent or painful, colourless or red, according to the degree of the inflammation. By gentle pressure its contents can be made to regurgitate through the puncta, and sometimes to pass through the duct into the nose. The palpebral conjunctiva and meibomian glands are more or less inflamed, the lids becoming agglutinated during the night; the eye is irritable and watery, especially when from any cause the lachrymal secretion is temporarily increased; and the patient is sometimes almost debarred from his customary avocations, when these involve much exercise of the organ, in reading, writing, &c. The inflammation is liable to occasional exacerbations from exposure to cold and other causes, during which it often passes into the ulcerative process, with the acute train of symptoms described under the preceding variety, and the aperture which is thus produced, either heals, or, the nasal duct having become permanently obliterated, degenerates into a fistulous opening, constituting the complaint denominated fistula lachrymalis. In many cases the disease disappears almost entirely during the summer months, and returns again on the approach of cold and variable weather.

Causes.—Though occasionally observed at every period of life, it most commonly appears in young persons with strumous constitutions, and, as already intimated, may arise either primarily, or by the extension of inflammation from other parts, as in catarrhal affections of the conjunctiva or pituitary membrane. It occurs, also, as a sequel of the eruptive diseases,—

small-pox, measles, and scarlet fever—and is sometimes seen in a very obstinate form, in connexion with chronic cutaneous complaints.

Treatment.—The primary indication is the removal of all inflammatory action, by leeches, fomentations, counter-irritation by blisters behind the ear, aperients, and other appropriate remedies. This having been accomplished, the tumour, if it do not spontaneously subside, should be frequently emptied by gentle pressure, and stimulating applications made to the conjunctiva, and edges of the lids; which either operate by correcting the morbid condition of that membrane, or are absorbed by the puncta and exert their influence on the mucous lining of the sac. Solutions of the nitrate of silver, the sulphate of copper, zinc, or alumine, the ointment of red precipitate (p. 59), or the unguentum hydrargyri nitratis in strength proportionate to the sensibility of the part, may be beneficially employed with this view. An inflamed condition of the organ often exists though the integuments preserve their natural colour; and the occasional application of a few leeches, followed by soothing measures, will frequently prove serviceable, when an opposite course would either fail, or be attended with an aggravation of the symptoms. In some instances the internal surface of the palpebræ undergoes the granular degeneration which will be hereafter described, and as this condition both aggravates and protracts the disease, appropriate means must be adopted for its removal. When the affection is strictly confined to the sac, the eye and its other appendages being healthy, we may resort at once to the injection through the puncta of one of the salts just mentioned; the sac having been previously emptied, and cleansed with

warm water. The injection should be repeated at intervals of two or more days, according to the effect it produces; if it excites much irritation, the solution must be reduced in strength, or tepid water alone substituted for a time. Sternutatories have also been recommended, and by acting as counter-irritants may sometimes be useful, but are more frequently unproductive of any benefit. The removal of cutaneous eruptions, and, in persons of strumous diathesis, the improvement of the general health, by mercurial aperients, the preparations of iodine, quinine, chalybeates, sea-bathing, and other alterative and invigorating measures, constitute important parts of the therapeia.

Should the preceding plan be ineffectual, another expedient may still be tried before having recourse to severer measures. Demours asserts, from his own observations and the authority of Bichat, that the nasal duct is never entirely obliterated—an assertion which, if true, must be restricted to the non-occurrence of direct adhesion between the opposing mucous surfaces—and experience demonstrates that previous to suppuration, the restoration of its permeability may often be effected on the principle of dilatation through the natural passages. The introduction through the puncta of the small graduated probes invented by Ancl, at intervals of two or three days, will generally overcome the obstruction, when it arises merely from thickening of the lining membrane. The operation is easily performed by any person acquainted with the anatomy of the parts:—the lid being drawn a little outwards from the eye, the probe is passed through the punctum from below upwards, as far as the angle of the canal, when it is made to describe a semicircle, and at the same time

gently propelled towards the sac, on entering which it rests upon the brow, pointing downwards and inwards, in a position nearly perpendicular. When the manœuvre is performed on the lower canal, where it is, perhaps, most easily accomplished, the probe is introduced from above downwards, and gradually depressed to a horizontal direction. In either case, the point of the instrument having reached the further side of the cavity, is turned downwards and backwards into the nasal duct until it comes in contact with the floor of the nostril; avoiding all violence in its course, and taking care that it does not become entangled in the folds or irregularities of the membrane. The probe should be again passed, after the irritation occasioned by its previous introduction has subsided; and injections of warm water, or some slightly astringent solution, may be employed in the interim. The size of the instrument should correspond with the increasing dilatation of the channel, and, in recent cases, a few repetitions will be sufficient to effect a cure, while in others the most persevering efforts will be required for that purpose.

When, however, this method fails, and the patient, unwilling to submit to the inconveniences of the complaint, with its contingent aggravations, is desirous for the employment of further measures, an incision must be made into the sac immediately below the tendon of the orbicularis, and a probe passed down to explore the condition of the part, and ascertain the permeability of the duct; this is then withdrawn, and a small bougie introduced and worn for a day or two, when it should be replaced by one of larger dimensions,—the passage being cleansed with tepid water at each removal, by means of an anelien syringe. After the bougie has

been used for a week or more, a gold or silver style about the thickness of a common probe, and an inch and a half in length, or long enough to traverse the whole extent of the channel, with a head obliquely set, should be substituted, and permanently worn;—removing it occasionally only, to cleanse the instrument and inject a little warm water or astringent fluid through the opening. Under this treatment, the patency of the canal is secured, the dilated sac gradually contracts around the style, and the tears, absorbed by the puncta, pass along its surface into the nostril. The cure is sometimes completed in a few months; but the obstruction is liable to recur if the style is removed too early. A small fistulous orifice sometimes remains after the restoration of the passage, and may be healed by the occasional application of the nitrate of silver.

Some surgeons prefer the immediate introduction of the style, which, in that case, should not be wholly withdrawn for the first three or four days after the operation; it should then be removed daily, the sac injected with some astringent lotion, and the instrument replaced,—the treatment being continued until, the channel having become permanent, the disease disappears.

Dr. Parrish trusts to the bougie alone, and has recently published an account of several cases successfully treated in this manner. A strip of fine linen, of a triangular shape, is immersed in a quantity of melted white wax, and when cold rolled to a proper size. The bougie thus made is cut into pieces of suitable length, one of which passed through the sac into the obstructed part of the duct. The instrument, retained *in situ* by bending the upper extremity upon itself, is increased in thickness as the passage dilates, and operates, besides its mechanical

agency, in producing a return of healthy action, by the stimulus which it occasions.

FISTULA LACHRYMALIS.

When an opening is formed in the sac by the ulcerative process, it may become fistulous, and, the nasal duct being obliterated, the morbid secretion of the membrane, mixed with the tears, flows over the cheek, constituting the complaint denominated fistula lachrymalis. The external opening may correspond with that of the sac, as in simple fistula, or there may be several orifices leading to one common aperture. Various complications may also exist, as occlusion of the puncta or obliteration of the canaliculi, concretions and fungosities in the lachrymal channel, caries of the unguis or turbinated bone, disease of the pituitary membrane, &c., &c. In many of these cases the passage is completely closed, a state of things denoted by the dryness of the corresponding nostril, lachrymation, and abundant mucopurulent discharge from the fistula. When the puncta or lachrymal canaliculi are likewise obstructed, the tears, not being absorbed, flow over the cheek, and are not mingled with the morbid secretion from the sac. The condition of the nasal duct should be ascertained by careful exploration with the probe, which, in conjunction with other indications—the nature of the discharge, and its bluish discoloration of a silver style—will detect the existence of caries, and also of communication with the nose through the posterior parietes of the sac, the presence of calcareous formations, &c.,—all which are possible, though very unusual occurrences,

—and thus enable the surgeon to pronounce an enlightened opinion upon the curability of the complaint. In its recent and simple form it is easily removed; when chronic the cure is more difficult, or palliative only; and in some of its complications it is quite irremediable.

The disease is especially common in persons of strumous constitution, and is sometimes seen as a sequel of syphilis; but after what has been said in the two previous sections, it is unnecessary to dwell in detail upon the causes producing it.

The primary indication in the treatment, is the removal of any general or local complication. If there is reason to suspect the presence of syphilis, some of the mercurial preparations, or the iodate of potash with the syrup of sarsaparilla, and such other measures as may tend to eradicate the infection and promote the restoration of healthy action, should be prescribed, according to circumstances. Appropriate means must also be employed to counteract the effects of the scrofulous diathesis;—and alteratives, as the liquor ferri hydriodatis, calomel with rhubarb or aloes, chalybeates, quinine, the warm-bath, exercise in the open air, removal to the country or sea-shore, with whatever may correct functional derangement and invigorate the system, will be usefully called into requisition for this purpose.

Any existing local inflammation should be removed by the occasional application of leeches, fomentations, and emollient cataplasms;—measures which are also frequently successful in dissolving induration, and restoring the natural secretion of the sac. In a languid and in irritable condition of the parts, an opposite treatment will be required; and a dossil of lint spread with the red precipitate ointment, or moistened with the

vinum opii, or the tincture of myrrh, may be advantageously employed. Compound cases, in which the external opening does not correspond with that of the sac, should be converted into simple fistulæ, by an incision made upon the extremity of a probe introduced along the sinus, and, if this do not afterwards heal under the use of appropriate remedies, it should be laid open in its whole extent with a bistoury.

The restoration of the permeability of the nasal duct may be among the beneficial effects of these preliminary measures; but if otherwise, an attempt may now be made to pass a probe along its course, which, by persevering efforts with an instrument of small size, may very commonly be done; a graduated series of probes should be used, the passage still farther dilated with the bougie, and, as soon as practicable, a silver style introduced, and worn as already directed. When the duct is entirely obliterated, it becomes necessary to force a passage with a trocar, or the triangular extremity of a probe.

Beer, and after him, Dupuytren, introduced a piece of catgut through the obstructed duct and nostril, and drew down a fresh portion every day; the superior part of the coil being secured under the hair of the forehead, and the lower extremity fixed by court-plaster to the side of the nose. It was used in several gradations of size, and as it obviates the necessity of the frequent introduction of the bougie, the plan may, perhaps, be usefully adopted in some cases.

ATONY OF THE LACHRYMAL SAC.

An atonic condition of the lachrymal reservoir, the consequence of previous inflammation, is sometimes observed, accompanied with relaxation of its membranous parietes, and enlargement from the accumulation of fluid within that cavity. It is unattended with any inflammatory action, and may continue for years without producing much inconvenience, provided the patient is in the daily habit by gentle pressure of emptying the sac, the contents of which escape through the nasal duct or puncta; otherwise the distension may give rise to inflammation, which is also liable to occur from catarrh and other causes.

Astringent solutions dropped upon the eye, or injected through the puncta, and stimulating frictions over the tumour, may be employed with occasional benefit; a graduated compress, so applied as to produce constant pressure upon the part, has also been recommended: failing to accomplish the object by such means, and the patient being unwilling to submit to the inconvenience of the complaint, an incision may be made into the sac, and a permanent cure effected through the instrumentality of the bougie and style.

When the nasal duct and lachrymal canaliculi are both obstructed, the secretion from the surface of the sac accumulates within its cavity, and a hard livid tumour is formed, which sometimes attains a considerable magnitude. It is known under the appellation of mucocoele, and the treatment consists in making an incision into the part, evacuating the inspissated mucus, and restoring the permeability of the passages.

INFLAMMATION OF THE LACHRYMAL CARUNCLE.

Canthitis Nasalis.

Like other parts of the body, the lachrymal caruncle and semilunar membrane are liable to inflammation from cold, local injury, or any accidental irritation. It is attended with pain, redness, a sensation as of the presence of a foreign body in the inner angle of the eye, lachrymation, and more or less irritation of the conjunctiva. The cause being removed, the inflammation is, in general, easily subdued by leeches, purgatives, and soothing fomentations. When suppuration is inevitable, it should be promoted by the usual means, the matter evacuated by an early opening, vitiated secretions corrected and granulations repressed by a solution of the nitrate of silver, or any other stimulating or astringent application. The caruncle is sometimes destroyed by ulceration, and the tears, no longer brought within reach of the puncta, accumulate in the inner canthus, and flow over the cheek, producing incurable stillicidium.

ENCANTHIS

Is a term applied to a chronic enlargement of the caruncula lachrymalis and semilunar membrane, which sometimes attains a considerable size, extending along the inner margin of the lids, interposing a mechanical obstacle to their closure, and exciting chronic ophthalmia, lachrymation, &c. Two species are described, one of which is said to be malignant, and to be charac-

terized by lividity, induration, lancinating pain, and an irregular varicose condition of surface, terminating eventually in ulceration. In some instances the enlargement has been owing to the presence of a foreign body, and has subsided on its removal.

Recourse should be had in the beginning of the complaint to the application of leeches to the adjacent integuments, and other measures calculated to abate irritation. If, however, this treatment does not succeed, and the excrescence occasions much irritation, or evinces a cancerous disposition, excision may become necessary. The operation is easily performed, by passing a ligature or tenaculum through the tumour, and detaching it from its connexions by means of the scalpel. Cases, however, requiring such interference must be extremely rare, as Mr. Lawrence states that none have occurred in his practice.

DISEASES OF THE PALPEBRÆ.

INFLAMMATION OF THE EYELIDS.

Blepharitis.

INFLAMMATION may affect the palpebræ either primarily, or by extension from the neighbouring parts; and may be either erysipelatous, phlegmonous, or catarrhal, according as it is seated in the skin, the cellular membrane, or the conjunctival lining.

ERYSIPELATOUS INFLAMMATION OF THE EYELIDS.

As a secondary affection, caused by the extension of morbid action from other parts, erysipelatous inflammation of the palpebræ is a common occurrence. Sometimes also, though more rarely, it originates in the eyelids, and is confined to them. The swelling is usually very considerable, often closing the eye, and presents a yellowish-red, scarlet, or livid appearance; the patient complains less of pain than of a burning sensation; and vesicles frequently form on the inflamed surface. The meibomian glands become implicated, and their vitiated secretion, mingling with the puriform discharge from the conjunctiva, concretes upon, and agglutinates the lids. In aggravated cases, and in cachectic habits, the inflammation occasionally extends more deeply, involves the cellular membrane, and terminates in sloughing or

ulceration—an unfortunate result, the parts seldom regaining their natural pliancy and mobility,—and disorganization of some of the appendages of the eye is not an uncommon sequel.

Breathing an impure atmosphere, unwholesome diet, derangement of the chylopoietic viscera, and whatever else can induce a depraved condition of the system, may be regarded as remote causes of this affection; and in persons thus predisposed, it is liable to occur from cold, and the action of trivial external irritants.

The treatment must be conducted on the general principles applicable to erysipelas in other parts of the body; emetics, cathartics, and even venesection, may be necessary to control the disease when it is accompanied with gastric disorder and high constitutional excitement, and must be employed as circumstances shall indicate, together with appropriate remedies—leeches to the adjoining integuments, punctures, the tincture of iodine, or the nitrate of silver,—for the relief of the local affection. When suppuration is threatened, it may sometimes be averted by an early incision through the integuments; and, at a later period, the opening thus made, will afford a ready outlet to the pus and disorganized cellular membrane. The matter in these cases evinces little disposition to approach the surface; and if the surgeon should delay interference in the expectation that it will acuminate, irretrievable mischief may be produced.

CARBUNCLE.

Carbuncle of the eyelids is sometimes seen in persons of advanced life and impaired constitution, and should

be treated as in other parts of the body, by an early incision and emollient dressings, in conjunction with opium, wine or porter, quinine, and other appropriate general remedies. Much attention is often required to obviate the injurious consequences arising from the extensive destruction of the cellular membrane which it occasions.

PHLEGMONOUS INFLAMMATION OF THE EYELIDS.

Phlegmonous inflammation occurs more frequently in children than adults, and in the upper, than in the lower eyelid. It is characterized by the usual symptoms,—pain, redness, and swelling,—often in a state of severe aggravation; and from the quantity of loose cellular tissue in the part, is very prone to terminate in suppuration. The tumefaction is generally so considerable as entirely to close the eye, the pain is much increased by motion, and the conjunctiva and meibomian glands sometimes participating in the irritation, the cilia and edges of the palpebræ are incrustated by their vitiated secretions. When suppuration has actually taken place, the pain becomes pulsative, the swelling increases, presents a livid, shining appearance, and the abscess points towards the middle of the lid.

The inflammation is sometimes connected with an unhealthy condition of the system, and occasionally supervenes without any assignable cause; more frequently, however, it arises from various accidental injuries, as the stings of insects, punctured wounds, contusions, &c. A well-marked case, recently treated by the author, was produced by a wound inflicted by

the tooth of an individual, with whom the patient came into sudden contact while turning a corner in the dusk of evening.

Treatment.—Suppuration is a frequent effect, and as ectropium, lagophthalmus, and other unpleasant consequences may result from the morbid changes which this termination induces, it is important to prevent its occurrence; and when this cannot be done, to limit its extent as much as possible. For this purpose leeches, cold applications, purgatives, and other measures, proportioned to the severity of the symptoms, will be proper in the first instance. If suppuration is threatened, it should be promoted by the usual means, and as soon as fluctuation can be felt, an opening must be made with a lancet parallel to the natural folds of the integuments; a caution important under all circumstances, but particularly so in strumous constitutions, from the tendency of inflammation, when thus modified, to involve the cellular membrane,—that tissue being less highly organized than the skin. Mr. Lawrence states that he had seen half a dozen cases of eversion of the upper eyelid, attended with distressing deformity, originating from this cause. The dispersion of the induration which sometimes remains, may be accelerated by the iodated ointments.

In all cases where an incision is made into the integuments of the eyelids, it is necessary to watch attentively the healing of the part, lest the contraction of the granulations should occasion ectropium—an event especially liable to happen if there has been any loss of the substance of the skin. When this result is apprehended, Mr. Houston recommends that the edges of the wound be kept asunder by strips of adhesive plaster, properly applied to the cheek and forehead, in order to counteract

the tendency to contraction, and ensure a cicatrix of sufficient breadth.

ŒDEMA OF THE EYELIDS.

Œdema of the eyelids is a frequent attendant on the various ophthalmiæ, inflammation of the lachrymal sac, &c.; but it generally disappears as the original disease subsides, and requires no particular treatment. It sometimes occurs in children of weak, lymphatic temperament, from derangement of the digestive organs or some less obvious cause; and is often induced by contusions, the punctures made by leeches improperly applied to this part, the stings of insects, &c. In the instances last mentioned, fomentations with warm water, to which a little laudanum or brandy may be added, ordinarily suffice for its removal.

INFLAMMATION OF THE EDGES OF THE EYELIDS.

Inflammation of the palpebral margins is known under the various appellations of ophthalmia tarsi, psorophthalmia, lippitudo, &c.; each of which is sometimes described as a distinct disease. It has its principal seat in the meibomian glands, and is attended with a troublesome pruritus, intolerance of light, lachrymation, and a viscous puriform secretion from the diseased parts. The mucous lining of the palpebræ is red and villous, the ciliary margins swollen and painful; little pustules which degenerate into ulcers form along their edges, and the viscid discharge, concreting around the roots of the cilia

during sleep, agglutinates the lids, so as to render it difficult to open them in the morning. The eye is irritable, and the patient frequently complains of a sensation as of the presence of some extraneous body; there is more or less uneasiness on motion of the organ, and the tears, increased in quantity and interrupted in their natural channel, flow over, and excoriate the cheek. The disease is met with in different degrees of intensity, and in its milder and more indolent forms may exist for a long time without any other mischief than the inconvenience which it occasions; in severer cases, however, it involves the bulbs of the cilia, destroys the eyelashes, implicates the cornea, and produces ulceration, thickening, irregularity and induration of the tarsal margins, ectropium, trichiasis, and other morbid changes.

Lippitudo may be regarded as the advanced stage of this affection; the edges of the lids are thickened and slightly everted, forming a red circle around the eye, which is irritable and subject to frequent attacks of inflammation; their conjunctival surface is not unfrequently granulated; the patient is troubled with stillicidium; the cilia fall out; and the meibomian apertures are wholly or partially obliterated:—when this occurs, the ciliary margins becoming smooth and rounded, the complaint may be regarded as incurable; though even in this inveterate condition, the situation of the sufferer may be rendered by judicious treatment much more comfortable than it would otherwise be.

Causes.—Ophthalmia tarsi is generally the sequel of some other affection,—measles, small-pox, catarrhal ophthalmia, &c.; but it may also be produced idiopathically by breathing a close impure atmosphere, and the habitual exposure of the organ to the action of various external

irritants. It is more common in children than adults, they being the first to suffer from the operation of these and other debilitating causes; and is often seen in connexion with the strumous diathesis, or complicated with porrigo and other cutaneous affections. It is consequently a frequent complaint among the poorer inhabitants of large cities, filling the wards of our hospitals, and when cured, is exceedingly liable to relapse, from re-exposure to the causes which originally induced it.

Treatment.—When the acute symptoms which are present in recent cases, have been removed by the employment of appropriate remedies—leeches when circumstances require the local abstraction of blood, aperients, a restricted diet, warm fomentations, some mild unctuous application to the edges of the lids at night,* &c., &c.—a stimulating treatment must be adopted, varying in activity according to the degree of individual susceptibility. Ointments containing the red and white precipitate, the nitrate, and the mild chloride of mercury; the oxide, carbonate, and sulphate of zinc; the acetate and sulphate of copper; the sulphuret of arsenic, iodine, creosote, &c., &c., have all been used with benefit in different cases; and, when practicable, should be compounded extemporaneously, as such articles are liable to become rancid by long keeping. The red precipitate, finely levigated, and incorporated with lard in the proportion of from v.—x. grains to the ounce,† is perhaps the best general remedy of this kind; and has this advantage over the

* R. Zinci oxid., ʒj.; adipis ppt., ʒj.; liq. plumb. subacetat., vin. opii, aa, ʒss. Ft. unguentum.

R. Adipis, ppt., vel cerat. simplicis, ʒss.; liq. plumb. subacetat., ʒss. Misce.

† Employed in 1817 by Dr. Gebhard of this city, in the proportion of thirty grains to the ounce.

reduced citrine ointment,—also an excellent application,—that it is of uniform quality and strength. Whichsoever substance is employed, should be well prepared, melted by the flame of a candle, and applied at night to the edges and inner part of the tarsi, by means of a camel-hair pencil,—all the encrusted matter having been removed by careful ablution, and the part previously dried. The lids, as before mentioned, cohere during sleep, and when forcibly separated, great suffering is produced, some of the eyelashes are torn out, and the disease is aggravated and protracted by the repeated irritation thus occasioned. To avoid this, the patient should be directed not to open his eyes till the matter has been thoroughly softened by a sponge wrung out of hot water. The complete removal of this agglutinating secretion is essential to the due application of remedies, and as it is always concreting from evaporation, should be an object of constant attention and admonition. When the vessels of the conjunctiva are much congested, or its surface granulated, the remedies must be directed more immediately to the removal of these conditions; scarifications are sometimes useful under such circumstances, or blood may be occasionally abstracted by leeches from the temples. A solution of the nitrate of silver applied to the everted lid by a camel-hair pencil, or a smooth crystal of the sulphate of copper, fixed in a quill, dipped in water, and lightly drawn across the membrane, as will be more particularly described hereafter, are the best topical applications; and may be repeated at intervals of two or three days until the granulations disappear. The nitrate in solution or substance, will also be serviceable in promoting the cicatrization of the little ulcers which form

along the palpebral margins; and that it may be brought more immediately in contact with the seat of the disease, it will be necessary, in some cases, previously to remove the half-loosened cilia. In the chronic varieties of this complaint, which crowd our ophthalmic institutions, these two articles indeed constitute our chief dependence, and with the red precipitate ointment at night, and soothing, astringent, or gently stimulating fomentations by day, make up the round of topical applications.

In the occasional exacerbations to which this affection is liable, leeches to the temples and other antiphlogistic measures are sometimes required; and aperient medicines, as calomel with rhubarb, &c., are necessary throughout the progress of the disease. The tincture of aloes, in the quantity of a drachm every morning, is a useful article of this kind for children, and may be conveniently exhibited in sweetened water. Counter-irritation by blister or the tartrate of antimony, behind the ear, back of the neck, or on the arm, is universally enumerated among the sanatory measures, and may sometimes be prescribed with benefit; but it is often followed by severe irritation, and in the experience of the author has been productive of less advantage in this and similar affections, than from the representations of others he had been induced to anticipate.

Particular attention should be given to the eradication of misplaced cilia, and the removal of every other cause of protracted irritation existing in the eyelids; and as the disease in its chronic stage is frequently connected with a debilitated condition of the system, or is dependent upon a strumous diathesis, tonic and alterative remedies often constitute an indispensable part of the

treatment: under such circumstances, the sulphate of quinine, the carbonate of iron, the preparations of iodine in combination with the syrup of sarsaparilla or the compound decoction of aloes, the warm salt bath, a pure invigorating atmosphere, exercise in the open air, a light, unirritating, but nutritious diet, &c., &c., are often eminently serviceable; and as patients enfeebled by the long continuance of this disease, are extremely sensitive to atmospherical vicissitudes, the utmost care should be taken, by proper clothing and other preventive measures, to guard against their injurious influence.

More is accomplished in the restoration of healthy action by the judicious employment of a few articles of approved value, than by multiplied and frequently varied prescriptions; the remedies above enumerated are generally successful when a cure is practicable; but others have been recommended by different writers, and the following formulæ, of which however, the author cannot speak from much personal experience, are subjoined, both as indicating the proportions used in such compositions, and also as being of probable utility in some cases.

R. Hydrarg. oxid. rubri, pulv. subtilissimi, gr. v.; zinci sulphat., gr. viij.; adipis ppt., 3j. Misce.—*Dupuytren*.

R. Hydrarg. oxid. rub., adipis ppt., ceræ albæ, aa p. e. Misce.—*Hufeland*.

R. Hydrarg. ammoniat., 3j.; oxid. zinci, bol. armen., aa 3ij.; adipis ppt., 3ss. Misce.—*Janin*.

R. Hydrarg. ammoniat., gr. xij.; camphoræ, gr. viij.; oxid. zinci, gr. xv.; adipis ppt., 3ijss. Misce.—*Jadelot*.

R. Hydrarg. submuriat., gr. xij.; oxid. zinci, gr. xv.; camphoræ, gr. viij.; adipis, 3ijss. Misce.—*Ryan*.

R. Oxid. zinci, adipis ppt., aa p. c. Misce.—*Wishart*.

R. Oxid. zinci, gr. xv.; zinci sulphat., gr. jss.; hydrarg. oxid. rub., gr. vj.; adipis, ʒij. Misce.—*Weller*.

R. Cupri sulphat., gr. x.; camphoræ, gr. iv.; oxid. zinci, gr. vi.; adipis ppt., ʒss. Misce.—*Weller*.

R. Cupri acetat., gr. viij.; hydrarg. ammoniat., gr. xv.; oxid. zinci, bol. armen., aa ʒj.; adipis ppt. ʒj. Misce.

The ointment of the white precipitate* is said to be especially adapted to the disease as it appears in advanced life; and an empirical preparation, known by the name of Singleton's, or the "Golden Ointment," the basis of which has been ascertained by Dr. Paris to be the sulphuret of arsenic, is recommended by Mr. Travers, and much employed by the British surgeons.

HORDEOLUM,

Or styte, is a small, painful, and furunculous swelling on the verge of the eyelids, slowly advancing to imperfect suppuration; it may exist in more immediate proximity to either surface, and the diversity of pain in different cases, may be explained by the greater or less density of the cellular tissue in which it is seated. The disease is frequent in children, and is often attributable to gastric derangement, or to a diet too gross and irritating. The inflammation is usually followed by the formation of a minute slough or core, and, as it commonly tends to suppuration, repellent applications are, in general, una-

* R. Hydrarg. ammoniat., ʒj.—ʒss.; adipis ppt., ʒss.; ft. unguentum.

vailing, if not positively injurious. The treatment consists in fomentations and emollient cataplasms; and, when sufficiently mature, the abscess may be punctured with the point of a lancet, or allowed to open of its own accord. Little suppurating tumours, unaccompanied by sloughing, sometimes arise in succession for a considerable time, especially in strumous children, or those afflicted with ophthalmia tarsi, or chronic conjunctivitis, and are productive of much annoyance. The proper remedies are, a spare diet, aperients, alteratives, and the red precipitate, or citrine ointment, mentioned under the preceding head, applied along the ciliary margins. The styne sometimes suppurates very imperfectly, or appears as an indurated tubercle, which frequently inflames, and excites more or less irritation of the eye; frictions and stimulating plasters may sometimes quicken it into more healthy action, but, when these fail, the tumour, if it occasions much inconvenience, should be opened with a lancet, and the nitrate of silver applied to its interior.

GRANDO, MILIUM, PHLYCTENULA, VERRUCA.

Grando, chalazion, or lithiasis, as it is indifferently called, is a small indurated tubercle, generally described as the result of an imperfectly suppurating hordeolum. It often disappears spontaneously after a time, but, if otherwise, resolution may be promoted by frictions with iodated ointments, and the application of a mercurial plaster. Milia are small white tumours, about the size of a millet seed, which form on the margin of the lid, and contain a soft adipose matter. They occasion little inconvenience, and, if it be thought proper to remove

them, are readily excised with the scissors; or the cyst may be punctured, its contents expressed, and the surface touched with the nitrate of silver. Phlyctenulæ are small transparent vesicles, which appear in the same situation; they rarely give rise to so much uneasiness as to require interference, and immediately subside on being punctured. Verrucous excrescences are easily removed by excision with the scissors, or by ligature, according as they are large and sessile, or small and peduncular. If it should be necessary to adopt measures to prevent their reproduction, the part may be touched with the nitrate of silver, or lightly cauterized by the sulphuric acid.

SYPHILITIC AFFECTIONS OF THE EYELIDS.

Syphilis sometimes attacks the palpebræ in the eruptive or chancreous form, and also in that of phagedenic ulceration, destroying in its progress the lids and neighbouring integuments. It generally accompanies or succeeds syphilitic disorders in other parts of the body, affects the margin or either surface of the palpebræ, and may be recognised by the history of the case, and the peculiar appearance of the ulcer or eruption,—the latter being either pustular, scaly, or papular. Instances are related in which the chancre was confined to the conjunctival lining, and occasioned so little irritation that it was only discovered by accidentally examining the condition of that membrane. The phagedenic variety is attended with severe pain and irritation, and exhibits a sharp, red margin, with foul, irregular surface. The same treatment is required as when the disease occurs in other situations;—calomel and opium, or the bichloride of

mercury, with the syrup of sarsaparilla, the application of the nitrate of silver when the ulcer assumes a chronic form, and such other remedies as the circumstances of each individual case may suggest. Whatever discrepancy of opinion may exist in regard to the necessity of mercury for the cure of syphilis, it is generally conceded that, when properly regulated, it is a useful auxiliary; and, in the present instance, the importance of the affected part calls for the prompt employment of all our resources.

CANCER OF THE EYELIDS.

Cancerous ulceration of the palpebræ is happily not of very frequent occurrence in this country. The disease is usually seated in the lower lid, and commonly appears in the shape of an indurated or scirrhus tumour, slowly followed by others, which unite to form a small group;—the integuments retaining their natural appearance, and thereby distinguishing them from verrucous excrescences, which are commonly rough and granulated. After these tubercles have existed for a period, varying in different cases, from several months to as many years, ulceration commences in the form of a slight abrasion or excoriation, accompanied with the discharge of a thin yellowish fluid, which concretes into an adherent scale upon the surface. Successive tubercles arise, and the ulceration, presenting a smooth, red appearance, and an irregular tuberculated margin, gradually spreads to the surrounding parts, destroying the palpebræ, penetrating the orbit, and, in some instances, completely denuding the eyeball. The progress of the ulcerative action is slow, and the disease may remain

nearly stationary for many years, receding at one point, advancing at another, and evincing, occasionally, a disposition to cicatrization, and even actual reparation. In its indolent stage it is not attended with much suffering, the general health continues unimpaired, and the lymphatic glands are not affected; but when the ulceration is more rapid, involving indiscriminately every tissue in its progress, the pain becomes severe, and is of a burning or aching character, and not unfrequently hæmorrhage takes place from the small venous ramifications which traverse the surface of the sore. When the ulceration has proceeded so far as to invade the orbit, and insulate the globe, sloughing and collapse of the organ ensues, the bones become carious, and the patient eventually dies exhausted by the protracted irritation, or, more suddenly, from meningeal inflammation. The malady differs in some of the particulars just enumerated from glandular carcinoma, as might, indeed, be expected from the difference of the texture in which it is seated; and much of the confusion which prevails on this subject has doubtless arisen from the error of considering that modification as the type to which cancerous degeneration in every part must necessarily conform. Mr. Lawrence and Dr. Jacob concur in regarding it as distinct, also, from lupus, or *noli me tangere*, to which it certainly bears many points of resemblance. Mr. Middlemore, who, under the title of a "peculiar ulceration of the eyelids," has described an affection similar to the foregoing, has likewise attempted to discriminate between it and genuine cancer of that part, which, according to him, originates in the subcutaneous cellular tissue, and is attended with lancinating pain, enlarge-

ment of the glands, and the other symptoms usually described as pathognomonic of the disease.

The causes of this complaint are altogether unknown ; it seldom occurs until after the middle period of life, may affect either sex, and is generally observed in persons whose health is otherwise unimpaired.

In the present state of our knowledge, the early and complete excision of all the diseased parts, affords the only well-grounded hope of a radical cure. Escharotics have been recommended with the view of destroying the morbid tissues, and when the ulceration is of small extent, and confined to the outer surface of the lid, may sometimes succeed in accomplishing a cure ; but, under other circumstances, they commonly produce a great aggravation of the symptoms. If extirpation be precluded by the age and condition of the patient, or the extent of the ulceration, all that is within the compass of art is to endeavour, by the employment of mild antiphlogistic measures, the occasional application of leeches, the internal exhibition of opium, and the use of soothing dressings, to mitigate suffering which it cannot cure. Mr. Lawrence relates a case of many years' duration, which was cured by the repeated abstraction of blood by leeching,—a remedy suggested by the frequent hæmorrhages which occurred from the surface of the ulcer ;—and in the instance of another patient treated by Mr. Travers, cicatrization was effected in the early stage of the complaint, by the free use of the nitrate of silver,—the disease, however, subsequently reappearing. The liquor potassæ arsenitis, administered internally, and a weak solution of the nitrate of silver applied to the ulcer, have sometimes appeared to exert a favourable influence

in retarding the progress of the symptoms; but have not been productive of permanent benefit.

When, in extirpating the diseased parts, it becomes necessary to include the upper eyelid, some writers recommend the removal of the globe also, lest the organ, deprived of its natural protection, should be destroyed by inflammation. That this result, however, does not always happen, is proved by the case to which allusion is made at page 33; in which the eye, though completely denuded by the accident, which occurred six years before, had been preserved moist and healthy under a covering of simple cerate. It would certainly be more rational to wait until the event anticipated had actually taken place, and then, instead of performing so formidable an operation, to induce collapse of the globe, by puncturing the cornea, and evacuating the humours.

TUMOURS OF THE EYELIDS.

Tumours form in the cellular tissue which enters into the composition of the palpebræ, or grow from the tarsal cartilage; and are of various degrees of consistence—solid, pulpy, melicerous, or gelatinous. The variety first mentioned is produced by interstitial deposition, usually following local injury, and its dispersion, to which there is, in most cases, a natural tendency, may be often accelerated by the use of iodated or mercurial ointments. The common adipose tumour, which is generally situated at some distance from the ciliary margin, the steatomatous, and the other species of encysted formation, when they are large, for the most part require extirpation; and the cyst may be either separated entire

from its connexions, or cut through the centre, and the divided halves extracted with the forceps. These adventitious growths may be located above or below the orbicularis, but, in either case, the incision must generally be made from without, and in a direction parallel to the fibres of the muscle. Care should be taken that the cyst is completely removed, and also that the incision through the integuments is sufficiently extensive to prevent embarrassment in the subsequent steps of the operation; which, in some cases, may be further facilitated by freely moving the tumour with the fingers for some days previous to its performance.

When the cyst is small, and the patient is averse to the use of the knife, the inflammation produced by simple puncture, or by the introduction of a thread, may be sufficient to obliterate its cavity.

A hard, round, and painful tubercle sometimes forms on the tarsal cartilage, and, on everting the lid, a small fungus may often be seen protruding through a depressed opening in the centre; in other cases, the tumour contains a glairy or gelatinous matter, or is of a soft vascular texture. It is closely connected with the tarsus, which is partially absorbed in its immediate vicinity, and the conjunctiva covering it, is also more or less inflamed. Mr. Lawrence suggests that it may be a diseased meibomian gland, and this appears not improbable from the fact that it is most common in the upper eyelid, is frequently accompanied with a disordered condition of the digestive organs, and subsides spontaneously when this is corrected, and the general health improved by aperients, alteratives, and tonics. If, however, notwithstanding these measures, it should continue to increase, or, remaining indolent, should excite much irri-

tation, it will be proper to evert the lid, and puncture the tumour, if it have not already opened, so as to permit the escape of its gelatinous contents; or it may be necessary to introduce the blunt extremity of a probe, and destroy its vascular organization. Should a fungus protrude through the aperture, it may be excised by the scissors, and the part touched with a pencil of the nitrate of silver.

NÆVI MATERNI.

Nævi materni are either venous or arterial; the latter being distinguished by their pulsation, increased temperature, bright scarlet colour, and rapidity of growth. Surgical interference is, in general, unnecessary while the nævus is small, as blemishes of this kind frequently disappear spontaneously, or continue stationary through life; but, if the vascular growth be large, or evince a disposition to increase, something must be done for its removal. In the early stage, an eschar may be produced by means of sulphuric acid, or other caustic applications, or inflammation of sufficient intensity to obliterate the vessels may be excited by the introduction of a seton: vaccination has also been recommended for the same purpose. In cases of greater developement, the ligature or knife will be required. The tumour being raised by the fingers, a needle, armed with a double ligature, is passed through its base, and tied on each side so as effectually to obstruct the circulation. Mr. Lawrence states that, in one instance, the morbid growth was so large that he found it necessary to tie it in three portions. Another method consists in introducing two needles, at right angles, through the tumour, and applying the liga-

ture beneath. Mr. Liston employs compression, but this is often precluded by the situation of the tumour. When the knife is used, it has been advised, in cases where the *nævus* is nourished by two or more vessels of considerable size, to throw a ligature around them previous to the operation, with the view of diminishing the magnitude of the tumour, and avoiding the excessive hæmorrhage which follows an incision into its substance.

ADHESION OF THE EYELIDS.

Of this affection there are two species, *anchyloblepharon*, or concretion of the tarsal margins, and *symblepharon*, or adhesion of the palpebræ to the globe;—they may exist either separately or combined. *Anchyloblepharon* is sometimes congenital, but both varieties are more frequently the result of inflammation following burns, the action of caustics, and other injuries. The first species, when partial, rarely exists in such a degree as to require interference; but, should an operation be deemed expedient, the cornea being unaffected, the lids may be cautiously separated by the knife. In more extensive concretions it will generally be found that the palpebræ are unadherent at the inner canthus, and the surgeon, introducing a small grooved director at this aperture, passes it across the globe, makes an incision upon its point, and unites the two orifices by dividing the intervening integuments. When the *anchyloblepharon* is complete—a circumstance which is of rare occurrence—the lids should be withdrawn from the eye in a vertical fold, a transverse opening made in the centre, sufficiently large to admit a director, and the incision

prolonged to each angle. The utmost caution will be necessary in all cases to prevent the reunion of the divided edges ; adhesive strips should be so arranged as to keep the parts asunder, and cicatrization promoted by a weak solution of the nitrate of silver, or some gently astringent application. Sir James Murray, of Dublin, relates the case of a girl whose eyelids were so completely adherent as entirely to destroy their natural appearance, upon whom he operated, notwithstanding, with the most gratifying results—vision being perfectly restored.

Symblepharon, or adhesion of the palpebræ to the globe is an accident very liable to happen when the abraded surfaces are extensive. If the attachment is loose, of limited extent, and does not involve any considerable portion of the cornea, a careful dissection will disengage the lid, and may be attended with some improvement of vision ; but when the patient enjoys the use of the other eye, it will be more prudent, unless the connexion is productive of much inconvenience, not to interfere. Demours indeed observes, that the complaint is generally aggravated by such attempts, and without due attention to the subsequent treatment, this will no doubt often be the case. Reunion is still more liable to take place in this variety than in the other, and is best prevented by the frequent motion of the eye, the proper application of adhesive plaster, and the occasional introduction of the blunt extremity of a probe enveloped in some unctuous material, between the separated surfaces. The nitrate of silver in substance or solution, may also be usefully employed for the same purpose. In some instances the lid may be drawn outwards by a ligature secured on the cheek ; the temporary insertion

of an artificial eye has also been suggested: but the most persevering exertions are often unsuccessful.

The writer above mentioned, makes a remark that may not be without practical utility in certain cases: in removing fungous excrescences which extend along the palpebræ, he performs the excision first on one lid, and afterwards, when the wound has healed, upon the other, thereby avoiding the possibility of adhesion between the two surfaces.

ECTROPIUM.

Eversion of the Eyelids.

Ectropium consists in an eversion of the palpebræ, in consequence of which the lining membrane is exposed, the globe partially denuded, and great deformity produced. It is more common in the lower, than in the upper lid, and is not unfrequently a temporary attendant upon purulent ophthalmia, being occasioned by the excessive chemosis which accompanies that disease. There are two principal varieties, one arising from thickening of the conjunctiva, and the other from burns and other injuries of the integuments, or from the consolidation and contraction following abscesses situated in the cellular tissue of the eyelids and the parts in their immediate vicinity. It may also be caused by the accidental division of either canthus, by tumours on the internal surface of the palpebræ, and by paralysis or relaxation of the orbicular muscle. The constant exposure of the denuded organ to the action of light and other irritants, produces much uneasiness; and if timely measures are not adopted to remedy the evil, the cornea

loses its transparency, vision is greatly impaired—in some instances entirely lost,—and the conjunctival lining of the lids becomes thickened, vascular, and more or less changed in texture, constituting the condition denominated ectropium sarcomatosum. The course of the lachrymal secretion towards the puncta being interrupted, epiphora is an invariable attendant.

Treatment.—In slight cases of ectropium depending upon a morbid condition of the lining membrane, the lid should be everted, and a smooth crystal of the sulphate of copper drawn across its surface at intervals of two or three days, as will be hereafter described, when treating of granular conjunctiva, or a solution of four, eight, or ten grains of the nitrate of silver may be substituted, and applied by means of a camel-hair pencil. The red precipitate, (p. 59) or reduced citrine ointment should be prescribed at night, some gently astringent collyrium used, if necessary, during the day; and these measures steadily continued, will gradually restore the healthy condition of the membrane, and effect a corresponding improvement in the position of the lid. If, however, they should prove inadequate to the accomplishment of this object; a portion of the thickened conjunctiva must be removed by excision with the curved scissors; when the lid, supported by a compress and bandage, may be expected to resume its natural state of close application to the globe, as the wound heals by the contraction of the granulations. In more aggravated cases, where the cartilage is elongated, and otherwise irregular, the excision, near its temporal extremity, of a triangular portion of the tarsus resembling the letter V, the careful approximation of the divided edges by means of suture, and the proper application of

a compress, will often succeed in accomplishing the readjustment of the part. Modifications of this operation, which is easily performed with the aid of a hooked forceps, and a sharp pair of scissors, have been proposed by Graefe and Dieffenbach; but though not wanting in ingenuity, they have not been tested sufficiently to warrant recommendation.

In eversion from cicatrix or abscess, the cure is much more difficult, and sometimes altogether impracticable,—the contraction of the granulations reproducing the displacement, as in the case alluded to on page 34, notwithstanding every effort to prevent it. Instances, however, have occurred, in which adhesions connecting the eyelid with the margin of the orbit, have been divided, the indurated cellular tissue removed, and the part restored to its normal position, when success had been previously deemed quite hopeless. In aggravated and inveterate forms of this eversion, the division of the cicatrix, the excision of the thickened conjunctiva, and the removal of a portion of the elongated tarsus, have all been simultaneously performed on the same individual. The partial detachment of a flap from the adjoining integuments, and its lateral transplantation, without torsion of the root, after the manner proposed by Dieffenbach, into the wound made by the separation of the lid from its unnatural connexions, has been successfully practised in a few instances, both in this country and in Europe.

Where the ectropium has been caused by the accidental division, and subsequent irregular reunion of either commissure of the lids, the treatment will consist in abrading the separated edges, and retaining them in proper apposition by the introduction of one or more sutures.

That variety of the disease which depends upon atony or relaxation of the orbicular muscle, and is denominated ectropium senile, is not likely to be permanently benefited by any remedies we may employ; though here, as in other intractable cases, astringent collyria, the application to the part of a solution of the nitrate of silver or a crystal of the sulphate of copper, gently stimulating ointments, the use of a shade to moderate the influence of external irritants, and other similar measures, will often succeed in palliating the inconvenience.

ENTROPIUM.

Inversion of the Eyelids.

Entropium is a much more formidable affection than the preceding; the constant friction of the inverted eyelid and cilia against the globe, quickly producing irritation, and, if not relieved, terminating ultimately in paniform opacity of the cornea, and total loss of vision. As a mere temporary condition it occurs in some cases of ophthalmia; the tumefied conjunctiva pressing out the orbital edge of the tarsus, while its ciliary margin is turned inwards by the action of the orbicularis, irritating the eye and greatly aggravating the inflammation. The disease when permanent, sometimes arises from relaxation of the integuments, whether occurring spontaneously in advanced life, or from the injudicious employment of emollient applications. Under these circumstances the convolution is occasionally so complete, that the cilia are turned into the interior of the coil, and the irritation is consequently much less considerable

than it would otherwise be. In other instances the defect is seated in the tarsus, and appears as a sequel of inveterate psorophthalmia or chronic conjunctivitis; ending, as they sometimes do, in various morbid alterations in the texture or configuration of the palpebral margin. The upper and lower lid are almost equally liable to be affected, and both may be inverted at the same time.

Treatment.—The temporary eversion may be remedied by strips of adhesive plaster, applied perpendicularly to the lid and cheek, and renewed from time to time, as they become loosened by the action of the tears. Pressure properly directed to the orbital edge of the tarsus has also been recommended, but is of more difficult accomplishment, and possesses no advantages which entitle it to preference. When the entropium depends upon relaxation of the integuments, an operation becomes necessary for the removal of the redundant portion, and if the inversion is inconsiderable, this is perhaps best effected through the agency of sulphuric acid; which not only destroys a portion of the skin, but consolidates the cellular tissue, and produces the requisite degree of eversion by the subsequent contraction of the granulations. A piece of wood, round, smooth, and about the thickness of a crow-quill, is dipped in the acid, and applied immediately behind the tarsal cartilage, in a line extending nearly the whole length of the lid. The patient should be so placed that the acid will not tend towards the eye, which must be guarded with extreme caution; and the fluid as it accumulates in undue quantity, should be absorbed from time to time by touching it lightly with a piece of folded linen. The operation, which requires from five to ten minutes for its adequate performance, occasions very little pain, and when the

alternative is the knife, will generally meet with ready acquiescence on the part of the patient. The part should afterwards be carefully washed, or the acid neutralized by an alkaline solution: in a few days the slough separates, the granulations contract, and an evident improvement is soon perceptible in the position of the lid.

When, however, the relaxation and inversion exist in greater degree, another procedure must be adopted. The quantity of superfluous integument having been accurately determined by including with the entropium forceps as much as may be necessary to produce the required eversion, the excision is performed with the knife or scissors; the portion thus removed, being situated in the immediate vicinity of the tarsal cartilage, and extending nearly the whole length of the lid. The edges of the wound are to be afterwards approximated, and secured by one or more sutures of fine silk. If the inversion should return after this operation, the suffering caused by the constant friction of the eyelashes against the globe, may be obviated by the excision of their bulbs, as in the operation for the radical cure of trichiasis.

In some cases where the cartilage appears to be chiefly affected, becoming shortened, irregular, and permanently incurvated, it may be preferable to divide it, by making with the scissors a perpendicular incision near each angle, through the whole thickness of the lid, so as to allow of its entire eversion, as proposed by Mr. Crampton, and afterwards to excise a portion of the integument in the manner which has just been described. Two or three ligatures are then introduced through the skin near the tarsal margin, the eyelid drawn upwards against the brow, and retained in that position for a few days,—the exposed mucous mem-

brane being covered in the interim with a piece of linen spread with simple cerate,—by confining the threads to the forehead with strips of adhesive plaster; or the edges of the wound made by the removal of the transverse fold of the integuments may be brought together by suture, and as the longitudinal incisions heal by granulation, a sufficient degree of eversion be thereby produced.

A more simple plan, originally suggested by Mr. Ware, and successfully practised by Mr. Tyrrell, consists in making a single perpendicular incision through the lid near its centre; the pressure caused by the contraction of the cartilage is thus relieved, and the wound slowly healing by granulation, little deformity is occasioned.

Mr. Saunders proposed a mode of operation which involved the extirpation of the tarsal cartilage; for this purpose a piece of horn or a plate of silver having a curvature corresponding to that of the eyelid, is introduced beneath the palpebra with its concavity towards the globe; an incision, extending from the punctum lachrymale to the outer angle, is made through the integuments and orbicularis, immediately behind the roots of the cilia, down to the tarsus; the skin is then turned backwards until the orbital margin of the cartilage is exposed, along which another incision is made through the conjunctiva, and the tarsus disengaged at each extremity by dividing it perpendicularly with the knife; care being taken to avoid injuring the punctum.

It may be proper to remark that these severer operations, though necessary to be known, as probably useful in some cases, are very seldom performed; it being generally sufficient, even in the more aggravated forms

of the disease, to excise the bulbs of the cilia as practised in trichiasis.

In a case of entropium of several months' duration, recorded by Dr. Jackson of this city, formerly of Northumberland, where the lower lid, which had become completely inverted during a prolonged attack of strumous conjunctivitis, was retained in its wrong position by the concurring action of the globe and the orbicularis muscle, the restoration was suddenly and permanently effected, after several ineffectual attempts, by the patient—a child of four years old—forcibly depressing the orbital edge of the tarsus, while the surgeon was occupied in drawing down the integuments of the cheek.

LAGOPHTHALMUS,

Oculus leporinus, or hare-eye, are terms employed to denote that condition in which the palpebræ cannot be closed, and the eye, deprived of its natural protection, is constantly exposed to the action of air and other external irritants. It is sometimes the result of paralysis of the orbicularis muscle, but is more commonly produced by retraction or shortening of the lid; and when it exists in any considerable degree, is often accompanied by inflammation of the conjunctiva, terminating eventually in opacity of the cornea, and other unpleasant consequences. The worst cases of the disease, those arising from the contraction following abscess of the lid, burns, and other injuries, have already been considered under the head of ectropium. When it is caused by paralysis of the orbicularis, it is usually

attended with a similar condition of the other muscles of the face, both being dependent upon some cerebral affection; in other instances it may be traced to cold and other causes acting upon the facial nerve in its transit or distribution; and is sometimes observed as the mere effect of the atony attendant upon age.

The treatment will vary according to the nature of the complaint. If it arise from retraction of the lid, relief may be afforded by the division of the cicatrix, and the other expedients recommended in that state of things; antiphlogistic expedients will be required in cases of cerebral congestion; and leeches, blisters, stimulating embrocations, &c., in the neighbourhood of the stylo-mas-toid foramen, will be the appropriate remedies where the facial nerve is the primary seat of the morbid action. When the disease is incurable, measures must be adopted to obviate the injurious consequences which may result from the constant exposure of the eye; it should be covered with a piece of linen spread with simple cerate, and such other means employed as may be necessary to prevent or remove inflammation.

TRICHIASIS.—DISTICHIASIS.

Inversion of the cilia occasionally happens while the lid retains its natural position, and is generally partial—a few eyelashes only deviating from their proper direction; though instances have occurred in which the entire series in the palpebræ of both eyes have been involved in the incurvation. The disease, which affects infants and children, as well as persons of adult age, is caused by the morbid changes consequent upon psoroph-

thalmia, and injuries of various kinds; and though on first impression it may not appear very serious, the constant friction of the cilia upon the globe occasions much distress; giving rise to the sensation as of a foreign body in the eye, producing great irritability of the organ, and terminating eventually in inflammation, and all the sad consequences of entropium. Distichiasis rarely occurs in the form of two distinct rows of cilia, but sometimes one or more lashes arise double from the same bulb, and grow in a wrong direction from the edge of the eyelid. The erratic hairs are generally very minute, soft, and white, and are very liable to be overlooked on a superficial examination. The more readily to detect them, the lid should be inspected laterally, as well as in front, and the patient directed to turn his eye so as to form a back-ground of the iris or pupil. In some cases assistance may be derived from concentrating the rays of light upon the part by means of a double convex lens. The ciliary margin should be brought into repeated contact with the globe, and attention will often be directed to the offending cilium by a slight accumulation of mucus around its root.

The palliative treatment consists in the extraction of the offending cilia by means of the forceps; in some instances it is necessary to repeat the operation every two or three weeks, and it occasionally happens that a permanent cure is thus accomplished. The forceps used for this purpose should be from one to two lines broad at the point, with their opposing surfaces in accurate contact, and the operation will be much facilitated by previously drawing them over a piece of white wax, in order to render them more tenacious in their hold. The hairs, which are often very tender, should

be grasped near their roots, and drawn out slowly in a straight direction, otherwise they are liable to be broken. When the irritation which they occasion is very considerable, and the patient is unwilling to submit to the annoyance of their repeated evulsion, it may be proper to endeavour to prevent their reproduction by puncturing the capsules, and touching them with the tartrite of antimony, or by some other escharotic, as proposed by Dr. Hunter. In some cases eversion of the lid in a degree sufficient to prevent the friction of the cilia upon the globe, may be produced by the application of sulphuric acid to the integuments as recommended for the relief of entropium.

In complete trichiasis, accompanied with a morbid condition of the palpebral margin, a radical cure may be accomplished by the excision of the cilia with the portion of lid containing their bulbs, after the method proposed by Professor Jæger. A piece of horn is introduced beneath the lid, as in Mr. Saunders' operation for entropium, and the surgeon makes an incision down to the tarsus the whole length of the inverted portion, parallel to, and about a line and a half from the ciliary margin, to which it is to be continued at each extremity; he then grasps with the forceps the edge of the wound which corresponds to the cilia, and carefully dissects the integuments from the cartilage, so as to include the bulbs of the lashes without involving the mucous edge of the lid. The surface thus exposed readily cicatrizes under the use of simple dressings, and the tarsus and meibomian apertures being uninjured, no inconvenience, and little deformity is produced.

In all cases of obstinate ophthalmia it will be proper to ascertain, by careful and repeated examination, whe-

ther the irritation of misplaced or inverted cilia has any agency in protracting the disease.

PTOSIS,

Or paralysis of the levator muscle, may occur as an idiopathic disease, or as symptomatic of disorder of the brain, or of intestinal irritation; and consists in a want of power to raise the upper eyelid, which may be either partial or complete. It is said to affect persons of strumous or lymphatic constitution more frequently than others, is sometimes periodical, and instances are also recorded of its congenital existence. When the affection arises from mechanical causes, it may easily be distinguished by the circumstance that the levator palpebræ, though unequal to the task of elevating the lid with its additional weight, evidently continues to exert its usual powers of contraction. In such cases, if the integument is thickened by inflammation, or the cellular membrane infiltrated by serum, it will be proper to make trial of frictions with iodated or mercurial ointments previously to resorting to any operation; but where these conditions are not present, and the obstacle consists chiefly in an extension or relaxation of the cutis, it becomes necessary to remove a portion of the superfluous membrane immediately above the orbital margin of the tarsus, in the manner recommended for the cure of entropium.

In ptosis from weakness or paralysis of the levator muscle, the treatment must be varied according to the cause upon which the inability depends, and this may be either exposure to cold, cerebral congestion from inso-

lation, the too free use of spirituous potations, morbid changes within the cranium, &c., &c. It is frequently complicated with paralysis of one or more of the other muscles of the orbit, and is often attended with vertigo and double vision,—the result, probably, of some deviation of the globe from its natural position, destroying the correspondence of the optic axes. In rheumatic ptosis, which may be directly traced to the action of cold, one side only is generally affected, and the abductor muscle retains its power; while, in cerebral cases, both eyes are commonly paralyzed, though it may happen that they were affected in succession: the latter, moreover, may be either sudden or gradual in their attack, according as they depend upon causes of immediate operation, or the slower developement of scrofulous tumours, and other morbid conditions of the brain.

If any indications of sensorial derangement are present, active depletion, both general and local, with saline cathartics and other appropriate remedies, will be indispensable; in the rheumatic variety, diaphoretics, as the compound powder of ipecacuanha, colchicum, mustard pediluvia, &c., may be combined with such antiphlogistic measures as the symptoms shall indicate; and in both, when the disease does not readily yield to the treatment employed, it will be proper to have recourse to the alterative exhibition of mercury. In other cases, attention to the improvement of the general health, and of the digestive organs in particular, the shower-bath, tonic medicines, stimulating embrocations before the ear and above the brow, galvanism, and counter-irritation on the temple or nucha, by blister, seton, or the tartrate of antimony, will often prove serviceable. Mr. Middlemore states that he has cured many cases of partial

ptosis, consequent upon strumous ophthalmia, by frictions with iodated and mercurial ointments. This gentleman was the first to propose the external employment of strychnia as a remedy in atonic ptosis, and, according to him, it acts much more efficaciously when the abraded surface to which it is applied is situated before the ear than when it is above the eyebrow. The following are the formulæ which he employs:—

R. Strychniæ, gr. 1-6, j.; pulv. iridis florent. gr. v.; sit pulvis in usum.

R. Strychniæ, gr. 1-6, j.: ungt. cetacei, ℥j. Misc.

Unpleasant consequences have sometimes followed the too liberal employment of this powerful article, and much caution, therefore, should be observed in its prescription.

Paralysis of the levator muscle is occasionally seen in chlorosis, and occurs sometimes in the complicated forms of hysteria, strongly simulating organic disease of the brain; when this is the case, the treatment should be conducted with reference to the cure of the primary disease.

DISEASES OF THE CONJUNCTIVA.

CONJUNCTIVITIS.

INFLAMMATION of the conjunctiva is a very frequent affection both in its primary and secondary forms ; there being few inflammatory diseases of the other tissues of the eye in which this is not also present in a greater or less degree. It occurs under several varieties, of which the principal are, acute conjunctivitis, or simple inflammation of the membranc ; purulent conjunctivitis, or inflammation accompanied with the secretion of a puriform fluid ; and strumous conjunctivitis, or inflammation modified by the lymphatic or scrofulous diathesis. There are also some other forms,—variolous, morbillous, scarlatinous, porriginous, &c.,—to which the conjunctiva is subject from its connexion with the cutaneous system.

SIMPLE ACUTE INFLAMMATION OF THE CONJUNCTIVA.

Symptoms.—Increased vascularity, pain, heat, a sensation as of sand or some extraneous substance in the eye, intolerance of light, and lachrymation, are symptoms by which, though one or more may be occasionally wanting, the disease is sufficiently characterized. The enlarged vessels are first visible at the reflection of the conjunctiva upon the globe, and pursue a tortuous course, freely inosculating with each other, until their

minute extremities finally disappear at the margin of the cornea. In some instances, the red vessels are so numerous as to impart to the eye an appearance of uniform vascularity; they even stand out in slight relief upon the surface, and may be observed to follow the motions of the conjunctiva, so that there can be little difficulty in determining the tissue in which they are seated. The pain varies in degree according to the severity of the inflammation, being sometimes slight, at others sharp and elancinating, and is chiefly caused by the friction of the palpebræ upon the conjunctiva, now morbidly sensitive, and irregular from the unequal turgescence of its vessels; small spots of extravasated blood are sometimes seen in the subjacent cellular tissue; there is an increased discharge of tears from sympathetic irritation of the lachrymal gland; more or less intolerance of light; and indications of constitutional disturbance—heat, thirst, quickness of pulse, lassitude, and other marks of sympathetic irritation—are frequently present in a considerable degree. In aggravated cases, other textures become involved; there may be extensive inflammation of the subjacent cellular membrane, with serous effusion, constituting the phenomenon denominated chemosis; or the disease may extend to the cornea, sclerotica, and iris, accompanied by the symptoms characteristic of the affection of those tissues;—these however, are complications which are rarely seen in simple conjunctivitis.

Diagnosis.—Inflammation of the conjunctiva is distinguished from scleratitis, by the colour, situation, and arrangement of the injected vessels; and also by the peculiar nature of the symptoms—the circumorbital pain, headache, and tension, the trivial redness, and the

absence of uneasiness on moving the lids—which characterize the latter form of disease. In conjunctivitis, the redness exhibits a bright scarlet colour, the vessels are tortuous, movable, and prominent, and are earliest visible at the angle of reflection upon the globe ; whereas in sclerotitis they have a pink or purplish hue, are more deeply seated, small, and straight, and make their first appearance near the margin of the cornea, which they encircle like a zone.

Causes.—These are numerous, and consist of chemical and mechanical irritants of every kind, undue employment of the eyes, and exposure to cold, intense light or heat—circumstances which more readily produce their injurious effect, when favoured by the existence of any constitutional predisposition, whether that be owing to idiosyncrasy, acquired irritability, or plethora induced by too great repletion, the suppression of habitual evacuations, want of exercise, &c. Whatever impairs the perfect adaptation which subsists between the palpebræ and the globe, will occasion inflammation of the conjunctiva; a granulated condition of the lining membrane of the upper eyelid—itself a remote effect—is a common cause, and tumours near the ciliary margin sometimes give rise to an obstinate ophthalmia, when, from the smallness of their size, they might be deemed inadequate to the production of such a result.

Treatment.—The primary indication is the removal of the exciting cause, so far as it may be in our power; after which the vascular perturbation—an instinctive effort of the system to repair the injury that has been received—will often spontaneously subside. Foreign bodies sometimes lodge beneath the upper lid occasioning acute pain, and may be easily detected by everting

it over a pencil or any similar instrument, placed along the orbital margin of the tarsus. From neglect of this simple procedure, the cause is often permitted to operate undiscovered, aggravating the inflammation, and prolonging the sufferings of the patient.

Dr. Monteath removed a piece of wood three quarters of an inch in length, and nearly as thick as a crow-quill, from beneath the upper lid of a person who applied to him merely for the relief of a slight inflammation induced by a fall among some bushes several months before; and similar cases, in which the extraneous body penetrating beyond the tarsal cartilage is not carried over the globe in the movements of the part, are related by Mr. Lawrence and others. A congested or fungous condition of the conjunctiva, with more or less tumefaction of the palpebræ, generally results from the protracted irritation thus induced, and when such a state of things exists, the lid should be carefully examined with a probe. If the foreign body be small, and have entirely penetrated beneath the conjunctival covering of the globe, it may either be removed by the forceps or scissors, or suffered to remain, according as it is likely to prove mischievous or otherwise. Particles of coal or iron impinging upon the anterior part of the eye, sometimes become embedded in its substance, and may be detached with the point of a cataract needle or toothpick; but if this cannot be done without exciting much irritation, it will be better to wait until they have become loosened by ulceration. Chemical agents will have generally ceased to operate before assistance can be procured, and the attention of the surgeon must therefore be chiefly directed to mitigate their effects. The

eye should be carefully bathed in warm water, and if any portion of the offending matter still remain, it may be expelled by forcible injection with a syringe.

These preliminary measures having been adopted, any slight degree of inflammation which remains, will generally soon disappear under the use of refrigerating applications, a light farinaceous diet, saline aperients, and such other means as may place the system in a condition favourable to the exercise of its restorative powers. When, however, this does not take place,—the increased action from the intensity of the cause, or idiosyncrasy of constitution, transcending the limits within which it would be salutary,—local depletion must be added to the preceding remedies, and should be performed by the application of leeches to the temples. It is not uncommon to direct them to be applied to the eyelids, and even to their conjunctival surface; but this should never be done, as, independently of the ecchymosis, the irritation which they produce, is generally followed by very unpleasant consequences. In severer cases, and especially when other tissues are implicated, or where—the general system sympathizing with the local disorder—there is any febrile excitement, venesection may advantageously precede the topical abstraction of blood; and the extent to which it should be carried must be regulated by the violence of the symptoms, and the age and constitution of the patient. One bleeding will generally be sufficient, and, except in cases of unusual aggravation, the subsequent treatment may be safely entrusted to purgatives, the neutral mixture with antimony, pediluvia, and the repetition of the leeches, as circumstances shall indicate. Emetics have also been

recommended, and are especially useful when the inflammation either originates in, or is associated with, a disordered state of the digestive organs.

Tepid applications are not only followed by less reaction than cold, but are commonly more grateful to the feelings of the patient; and the eye may be occasionally fomented during the day with a soft sponge wrung out of hot water, and covered in the interim with a fold of linen wet with a weak saturnine solution, which will both act as a refrigerant, and prevent the irritation that might be produced by the motion of the lids.

The march of the disease having been arrested, and the ascendancy given to the recuperative powers of the system, by the judicious employment of the means which have just been directed, it will be proper to abstain for a while from any thing which may further depress the vital energies; time is required for the repairment of injury, or the resumption of healthy action; and as this is a period often discouraging to the patient, who, averse to confinement, imagines that because the sound state of the organ is not immediately restored by what has been done, he is making no adequate progress towards a cure, it may be appropriately and advantageously devoted to measures of counter-irritation. Opportunely prescribed, this is an important auxiliary in the treatment, but mischief is often done by its early and indiscriminate employment. In some constitutions, the erethism it occasions more than counterbalances the good effects it might otherwise produce, and it should, in no instance, be directed until the activity of the symptoms has been subdued by depletion. It is most effectually accomplished by blistering with cantharides, and the application may be made behind the

ear, on the nape of the neck, and in protracted cases between the shoulders, or on the arm ; sinapisms, and frictions on the temples with ammoniacal and other rubefacient liniments, are also useful in some cases.

At this juncture, also, when the inflammation, instead of subsiding, evinces a disposition to assume a chronic form, characterized by a congested or relaxed condition of the conjunctival vessels, with lachrymation, and irritability of the organ, advantage will be derived, in addition to the further use of mild antiphlogistic or alterative and invigorating measures, as the circumstances of each particular case may require, from the employment of local stimuli and astringents. A solution of four grains of the nitrate of silver may be taken up in a quill,* and dropped upon the eye once a day ; the palpebræ being occasionally fomented in the interval with warm water, the decoction of chamomile, or any gently stimulating collyrium. The vinum opii in the proportion of half a drachm, with an equal quantity of acetic acid, or of the liquor plumbi subacetatis, to a pint of water, will often prove a convenient lotion of this kind. Solutions of two or more grains of the sulphate of copper, zinc, or alumine, with the addition of a few drops of laudanum, or the vinum opii, undiluted or otherwise, according to the sensibility of the organ, may be substituted for the nitrate of silver, but as a general application this is preferable to every other.

When the disease occurs in individuals of lymphatic

* This little manœuvre is performed by introducing a quill, open at both extremities, a short distance into the solution, and closing the upper end with the finger ; the quill is then held over the eye and the lids separated, when the finger being removed, the fluid, no longer upheld by atmospheric pressure, flows out upon the globe.

constitution, or in an enfeebled condition of the system, after the acute symptoms have been removed by leeching, and such moderate antiphlogistic measures as may be indicated, tonic medicines, as the sulphate of quinine, the infusion of chamomile and valerian with the compound tincture of cinchona, the carbonate of iron, a nutritious diet, and whatever tends to invigorate and support, will frequently exert a beneficial influence. A similar course of treatment is also demanded in those maltreated cases, where, after the too copious abstraction of blood, and the persevering use of other debilitating measures, uncombined with the due employment of topical applications, an atonic or congested state of the conjunctival vessels is the chief remaining symptom. The tincture of guaiacum, in the quantity of a drachm three times a day, may be sometimes usefully prescribed under such circumstances.

The patient should of course abstain from all exertion of his eyes, and, if there be much intolerance of light, they should be lightly covered with a shade of green silk. Confinement to a dark room is not generally necessary, and in chronic cases advantage will be derived from the free exposure of the organ to the open air.

CATARRHIAL INFLAMMATION OF THE CONJUNCTIVA.

This variety of conjunctival inflammation is marked by the same general symptoms,—increased vascularity, pain, heat, lachrymation, &c.,—as the preceding. In mild cases the disease is chiefly confined to the palpebræ and circumference of the globe; the tarsal margins

are swollen and irritable; and when the secretion from the conjunctiva, suppressed in the commencement, is subsequently restored, there is a copious effusion of muco-purulent matter along with the tears. This puriform secretion, which is one of the most striking characteristics of the complaint, is at first thin, viscid, and opaque, but in the progress of the disease gradually assumes a more decided purulent appearance, and, mingling with the vitiated discharge from the meibomian follicles, concretes around the roots of the cilia, and agglutinates the lids during sleep. The sensation as of the presence of some extraneous body is often very distressing, but both the pain and the intolerance of light are much less in proportion to the vascularity than in simple conjunctivitis. The redness exists in various degrees, being in some instances partial and irregular, while in the severer grades of inflammation, the whole surface of the eye becomes uniformly injected, and the conjunctiva, elevated by serous effusion into the loose cellular tissue connecting it with the sclerotica, forms a broad circle around and overhanging the cornea. There is an exacerbation of the symptoms at night, partly owing, perhaps, to the conjunctival vessels being more easily distended in the horizontal posture; and the usual indications of catarrh—heaviness of the head, obstruction of the nasal passages, hoarseness, &c.,—are commonly present, with a degree of constitutional irritation corresponding to the severity of the local disorder.

An inflammatory affection, differing from the foregoing only in its more strict limitation to the palpebræ, is sometimes made by authors the subject of separate dissertation, but there is really no necessity for thus

multiplying divisions. Most of the symptoms just enumerated are present in a still milder form; the patient complains of an itching or smarting sensation in the eyelids, and when these are everted, their conjunctival lining has a red and villous appearance. A muco-purulent discharge takes place from the inflamed membrane, the meibomian glands are also involved, and the mingled secretions, spreading over the cornea in the act of nictitation, often occasion temporary confusion of vision. There is an irritable or feverish condition of system; the eye, weak and lachrymose, is impatient of employment; and the disease, which is liable to aggravation from slight causes, is frequently protracted, when allowed to run its course undisturbed, to a period of several months. In lymphatic or strumous constitutions it not unfrequently degenerates into the chronic form described under the head of ophthalmia tarsi, terminating eventually in ulceration and thickening of the palpebral margins, destruction of the cilia, obliteration of the meibomian apertures, ectropium, and other morbid changes.

The general appearance of the inflamed organ, the catarrhal symptoms, and the muco-purulent discharge, sufficiently distinguish this variety of inflammation from that which we have just considered: some writers have also attempted to define the boundaries which separate it from purulent ophthalmia, but the two diseases do not appear to differ in any very essential respect, and the one is probably only an aggravated form of the other.

Causes.—Atmospherical vicissitudes,—whence it not unfrequently appears as an epidemic,—exposure to the night air; and cold variously applied, are the ordinary causes of catarrhal ophthalmia. It is, consequently.

most prevalent during the changeable weather of autumn and spring; and is sometimes propagated through families, and public institutions, where many persons, particularly children, are collected together.

Treatment.—In mild cases, venesection is seldom required, and even local depletion may be frequently dispensed with; gentle laxatives, and saline diaphoretics during the day, the warm bath or pediluvium, and Dover's powder at night, with fomentations of warm water, and a fold of linen moistened with some evaporating lotion in the interval, being, in general, all that is necessary. When the symptoms are more severe, and especially if chemosis, or any deeply-seated or circumorbital pain is present, venesection will be demanded, and it will, moreover, be proper to abstract blood by leeching from the temples, or cupping from the nucha; and also to establish a more active derivation from the intestinal canal. Should there be much neuralgic pain and lachrymation, a little laudanum, vinum opii, or tincture of camphor may be added to the water of fomentation, or any anodyne decoction may be employed as a substitute. Hops or chamomile flowers enclosed in a flannel bag, steeped in water, and held against the eye for a few minutes, furnish a convenient mode of applying warmth; and, under similar circumstances, benefit has been derived from exposure of the organ to the vapour arising from a mixture of laudanum and the tincture of camphor in a tea-cupful of water, elevated to the boiling temperature.

The local treatment is a matter of primary importance in the management of this ophthalmia; and the application of a solution of the nitrate of silver to the surface of the inflamed membrane should be made concurrently with such of the measures just enumerated, as

may be deemed necessary in any particular case. It always exerts a controlling influence over the complaint, mitigating the symptoms, and shortening its duration; and may be freely employed from the commencement of the puriform secretion. A solution of four or ten grains to the ounce, according to the activity of the inflammation and the extent of the discharge, should be dropped upon the eye, once or twice a day, in the manner already described; and the palpebræ, meanwhile, fomented occasionally with a warm saturnine lotion, or with a collyrium containing one grain of the bi-chloride of mercury in ten or twelve ounces of water. At night, the purulent secretion having been carefully removed from the lids, the red precipitate ointment, (p. 59,) or the unguentum hydrargyri nitratis, reduced by admixture with three or four parts of lard, should be applied along the ciliary margins; and when these are agglutinated in the morning, the incruusted matter should be softened by fomentation with warm water, before any attempt is made to separate them.

An inflamed condition of the conjunctival lining of the eyelids, is a common attendant upon all the grades of catarrhal ophthalmia; and in many cases, the disease, as has been stated, does not extend beyond that part. It is very liable to pass into the granular degeneration hereafter to be noticed, entailing much misery upon the patient, and leading to opacity of the cornea, and various morbid alterations of the tarsal margins. In all cases, therefore, of much intensity and long duration, frequent examination should be made into the state of the lid. If the vessels are found to be much congested, and indications of active excitement still exist, leeches should be applied to the temples; scarifications with the lancet are

sometimes useful in the atony and relaxation of a more advanced period; but, under these circumstances, the application, at proper intervals, of a solution of the nitrate of silver, by means of a camel-hair pencil, or of the sulphate of copper in substance, as will be subsequently explained, will generally succeed in restoring the healthy condition of the membrane. Some English surgeons have spoken in terms of high commendation of the nitrate applied in substance to the external surface of the palpebræ; but of this practice the author has no personal experience, and observation of its effects when adopted by others has not prepossessed him in its favour.

The chemotic swelling of the conjunctiva affords a pretty certain indication of the severity of the inflammation; and it has been conjectured that the tumefaction, by abruptly bending the vessels upon themselves, may interrupt the circulation, and thus have some mechanical agency in producing gangrene of the cornea. However this may be, measures should be promptly taken to avert, if possible, an event so unfortunate. When the chemosis is great, and the danger imminent, scarifications will be required, but, in lesser degrees, it may be successfully treated by touching the tumefied membrane with a camel-hair pencil dipped in a solution of ten or twenty grains of the nitrate of silver;—the application to be renewed, if necessary, on the succeeding day.

Repeated recommendation of this article will be made in the present volume, and perhaps a more liberal use of it inculcated in purulent conjunctivitis, than many of its readers may have been accustomed to adopt. Experience, however, will convince the most sceptical of its value, when employed in the manner and under the re-

strictions mentioned. After the fulness of the vascular system has been lessened, and the force of the circulation controlled by depletory measures, it is well known to possess in high degree the power of allaying the irritation of the mucous membranes; and in the puriform diseases of the conjunctiva more especially, no single remedy is susceptible of such universal application.

The diet of the patient should be made to conform to the general indication of cure; and counter-irritation by blister behind the ear or on the nape of the neck, may often be advantageously prescribed when the inflammation evinces a tendency to subside into the chronic stage.

The stimulating plan of treatment, under various modifications, is adopted by numerous authors—Ridgway, Watson, Melin, Walker, Guthrie, Mackenzie, Lawrence, &c., &c. The gentleman first mentioned, recommends a solution of the nitrate of silver in the proportion of ten grains to the ounce, Mr. Walker applies it in substance to the inner surface of the eyelids, and Mr. Guthrie employs it in the form of ointment; which, however, is inferior to the article either in its fluid or solid state, and, if used at all, should be restricted to some of the more chronic sequelæ of the complaint.

When the disease is protracted from debility, such measures must be adopted, as will tend most effectually to invigorate the system; but, on this point, nothing need be added to what has been already said under the preceding head.

A morbid condition of the ciliary margins, and of the glandular apparatus of the eyelids, sometimes remains as a consequence of catarrhal inflammation, and must be treated as has been directed when speaking of ophthalmia tarsi.

PURULENT OPHTHALMIA.

The extensive prevalence of this form of inflammation, its influence upon military operations in warm climates, and the dreadful ravages which it has occasionally committed, have long rendered it a prominent object of regard, and may require a separate notice of it here, though, as has been already intimated, it appears to be merely an aggravated form of catarrhal conjunctivitis. It is very common in warm countries, and prevailed extensively among the British and French troops employed in the Egyptian expedition. Of the former alone, the hospitals of Chelsea, in London, and Kilmainham, in Dublin, contained at one time two thousand three hundred and seventeen, totally blind in consequence of this disease! The valley of the Nile appears, indeed, to be its favourite locality, and the traveller Ledyard, writing from Cairo to Mr. Jefferson in 1788, enumerates an "almost universal blindness" among the evils which afflict its inhabitants. In Europe, on the contrary, it seems to have been little known previously to the return of the hostile armies from the expedition alluded to, though it has since appeared as an epidemic among the garrisons of Italy, Germany, Holland, and other countries.

The symptoms vary in degree from a slight affection of the palpebral lining, to inflammation of the most vehement character, involving the whole surface of the conjunctiva, the subjacent cellular tissue, extending to the denser textures beneath, and frequently followed by destruction of vision, and total disorganization of the eye.

It commences with many of the phenomena which accompany the incipient stage of catarrhal ophthalmia, and, like that affection, is principally characterized by the profuse discharge of a viscous secretion—sometimes preceded by hæmorrhage—which soon becomes distinctly purulent. The eyelids are greatly swollen and distended, and, when separated, the puriform matter flows over the cheek, while the conjunctiva covering the globe exhibits an appearance of turgid and uniform vascularity. In severer cases chemosis occurs in a high degree, the tumid conjunctiva almost burying the cornea beneath its fold, everting the lower lid, and even protruding between the palpebræ. The pain varies according to the nature of the tissues which are implicated: when the inflammation is limited to the conjunctiva it is inconsiderable, and the patient often complains chiefly of a sensation as of particles of sand in the eye; but where the denser membranes are involved, it is frequently excruciating, especially around the orbit, and has a deep, pulsative, and aching character, subject to occasional exacerbations. It assumes sometimes the form of hemi-crania, and is accompanied with an agonizing sense of tension, as though the eye would burst. In this state of aggravation the constitution early sympathizes with the local disorder; sleep is prevented by the intensity of the suffering, and in many instances the health of the patient is seriously impaired by the prolonged irritation. The disease evinces a strong disposition to relapse, and a granular condition of the palpebral lining, consisting principally in an enlargement of its mucous cryptæ and papillæ—the latent or chronic form of the German writers—is not an unfrequent sequel. When resolution does not take place, the inflammation may terminate in

various morbid affections of the palpebræ,—chronic ophthalmia and vascular thickening of the conjunctiva, opacity, ulceration, sloughing, rupture, or staphyloma of the cornea, prolapsus and adhesion of the iris, or escape of the humours, and collapse of the eyeball.

In regard to the prognosis, it may be stated in general terms, that when the chemosis is slight, the pain neither intense nor deeply seated, and the transparency of the cornea little impaired, there is reason to expect a favourable termination from the early and efficient employment of the appropriate remedies; but where, on the other hand, the tumefaction is so great as almost to conceal the cornea, and is attended with severe, tensive, and throbbing pain, the organ is in imminent danger of serious injury. Though always intractable in its aggravated form, it is much more so in persons of strumous constitutions than in others.

Causes.—Purulent ophthalmia is not of very uncommon occurrence in our own country, and its more extensive prevalence in warm latitudes, is probably owing to the greater intensity of light and heat, the wider range of atmospherical vicissitudes—more severely felt from the susceptible and debilitated condition of the cutaneous vessels—imperfect ventilation, inattention to cleanliness, &c., &c.,—causes which induce a predisposition to disease of the dermoid and mucous tissues, and render the conjunctiva especially, liable to inflammation from smoke, dust, and other accidental irritations. A weak, lymphatic, or strumous temperament, unwholesome food, inadequate clothing, the abuse of spirituous liquors, constipation, and a particular tendency in some individuals to catarrhal affections, may be further enumerated among the predisposing causes. When

once produced, however, there is reason to believe that it is capable of propagating itself by contagion, and that, though not in general actively infectious, it acquires additional virulence from a confined and vitiated atmosphere, and other accidental circumstances.

The French slave ship *Rodeur* affords a melancholy instance of the ravages of this ophthalmia, under circumstances propitious to its extension. The disease made its appearance first among the slaves, one hundred and sixty in number, fifteen days after her departure from the coast of Africa; and subsequently spread among the crew,—one sailor only escaping, and he was attacked shortly after their arrival at Guadaloupe. Of twenty-five persons composing the crew, vision was destroyed in twelve, including the surgeon; five lost one eye, and four escaped with opacity of the cornea, and adhesion of the iris. Of the negroes who survived the voyage, thirty-nine were totally blind, twelve lost each an eye, and fourteen had corneal opacities.

Treatment.—Two opposite modes of treating this disease, the antiphlogistic and the stimulating, have been extensively practised, and though there is now much more unanimity than formerly, opinion is still divided in regard to their relative value. This discrepancy, however, is the result of a partial view of the subject. The capillaries, governed by laws of their own, and independent, to a certain extent, of the general circulation, are in a state of relaxation and congestion; they do not contract with their accustomed vigour, precisely as a muscle becomes inert or powerless when inflamed; and remedies addressed immediately to them, have consequently a decided influence in restoring their healthy action. The importance of the affected organ,

and the rapid progress of the disease in its severer grades, call, moreover, for all the resources of art; and experience proves what reason should, *a priori*, have taught, that more is gained by the judicious employment of both methods, than from the unaided operation of either.

The disease, as above intimated, is merely an aggravated degree of catarrhal inflammation, and much that it would otherwise be necessary to say respecting the treatment, has been anticipated in the history of that complaint. The greater vehemence of the symptoms demands, of course, corresponding activity in the remedial measures, but in the prescription of those of a depletory character, it should not be forgotten that inflammation of the mucous membranes is less obedient to the lancet, than that of some other tissues; it cannot indeed be safely entrusted to bleeding alone; and though circumstances require the adoption of a vigorous line of practice, this may be carried so far as to impair unduly the recuperative energies of the system, and thus render the disease more destructive in its consequences than it would otherwise have been.

In robust and plethoric individuals, and generally in all cases accompanied with supra-orbital pain, headache, chemosis, and a sense of tension or throbbing in the eye, blood should be freely drawn from the arm, and if the severity of the symptoms continue unabated, the vein may be reopened either on the same, or the following day; but where the health is feeble, or the inflammation, less violent in its character, does not extend beyond the conjunctiva, venesection, if prescribed at all, must be practised with a much more sparing hand. In lymphatic temperaments, and in secondary attacks in which

the morbid condition of the palpebræ stimulated into activity by some accidental cause is the chief agent in the developement or reproduction of the malady, and where, moreover, the patient has not fully recovered from the exhaustion induced by previous suffering, ultimate injury to the constitution, with present aggravation of the symptoms, has frequently been the result of unguarded depletion. It is cases like these which call into requisition all the skill of the practitioner: the vehemence which inflammatory action sometimes assumes under such circumstances, appears to require vigorous measures for its abatement, while these are unfortunately contra-indicated by the anæmic condition of the system; and in endeavouring to avoid Scylla he is consequently in danger of falling into Charybdis.

The repetition of the bleeding will not, in general, be required, but recourse may be had to local depletion in almost every instance, and especially when the occurrence of the supra-orbital pain announces the extension of the inflammation to the fibrous tissues; in which contingency, it will be proper to administer calomel in combination with opium at night, to such extent as, without salivation, to produce its alterative operation. An active cathartic should always be given in the commencement, followed by saline laxatives through the whole course of the disease; mustard pediluvia and counter-irritation will prove useful auxiliaries; and in aggravated cases, advantage will be derived from the internal exhibition of the tartrate of antimony, and other medicines which possess a controlling power over the circulation.

The fulness of the vascular system having been diminished, and the constitutional excitement allayed by these antiphlogistic measures, the nitrate of silver be-

comes our principal reliance; and in many instances indeed, may be used, without previous preparation, from the very commencement of the complaint. The strength in which it is prescribed, must be regulated by the degree of the chemosis, and the profuseness of the blenorrhœa; the sensibility of the membrane being impaired by the tumefaction, little irritation follows its application, and the instant decomposition of the salt by the matter constantly oozing from the conjunctiva, obviates all danger of lesion or disorganization. In cases of comparative mildness, a solution of four, eight, or ten grains, should be dropped upon the eye, or applied to the conjunctiva by means of a camel-hair pencil, once or twice a day; but in higher grades of inflammation it may be safely increased to fifteen or twenty grains, care being taken to reduce its strength as the puriform discharge abates, and the membrane resumes its healthy condition. Under circumstances of still greater aggravation, the nitrate in substance may be lightly drawn along the inflamed surface of the lower lid, or, where the cellular infiltration of the conjunctiva is so considerable as to threaten disorganization of the cornea, applied, after free scarification, directly to the chemotic swelling. When the upper eyelids can be everted, their condition should be carefully inspected, and this little volume will not have been written in vain, if it serve to impress this single injunction on the mind of its readers. The inflammation commences in the palpebræ, the nerves and vessels which supply their inner surface are continuous with those of the conjunctiva, and in them the morbid alteration occurs, which is the source of so much present and future mischief. Common sense, therefore, dictates the propriety of directing our applications

more immediately to that quarter, and this should be done from the commencement, were it not precluded in most cases, by the greatness of the tumefaction. Leeches to the temples are highly useful under such circumstances, and in small number may be repeatedly applied during the continuance of the active symptoms.

The eyelids ought to be frequently separated, in order to prevent their agglutination, and permit the escape of the purulent secretion; the inflamed parts, previously cleansed with a fold of soft linen, should be bathed several times a day with simple warm water, or with the weak solution of the bi-chloride of mercury, mentioned under the preceding head; and the attendants and others cautioned against using towels, sponges, &c., which have been in contact with the discharge.

Pain around the orbit may be alleviated by frictions with laudanum or any anodyne embrocation; a warm saturnine solution with the tincture of opium, used as a fomentation, sometimes affords much relief; the red precipitate ointment (p. 59), may be applied along the edges of the lids at night; and sleep procured, if necessary, through the intervention of morphia, or the compound powder of ipecacuanha.

The plan of treatment above detailed is adopted also with slight modification by the gentlemen—Doctors Hays, Fox, and Parrish—associated with the author in the surgical management of the Wills Hospital; and a course not very dissimilar is recommended by many of the British surgeons. The nitrate of silver is regarded by all as a remedy of undoubted efficacy, and though entire unanimity of opinion respecting the extent to which it may be safely carried, does not yet exist, there is evidently a much nearer approximation to it than

formerly. Messrs. Mackenzie and Melin prefer a solution of four grains, and speak unqualifiedly of its good effects; Mr. Lawrence, though he also uses it in that proportion, appears to be somewhat less decided in its commendation; Mr. Ridgway increases the quantity to ten grains; and Mr. Walker states that he has frequently applied it in substance to the inner surface of the palpebræ, in all ages, and at every period of the inflammation, with the most gratifying result. Mr. Guthrie's ointment,* though so highly extolled by him, has not equalled the expectations of others. It occasions more irritation than the nitrate in substance or solution, is more variable in its effects, and should be restricted to chronic and torpid cases, attended with thickening of the conjunctiva and superficial opacity of the cornea;—it is rarely employed under any circumstances at the Wills Hospital.

Dr. O'Halloran applies the sulphate of copper in substance to the palpebral lining, or drops upon the eye a solution of ten grains of the nitrate of silver. He has treated several hundred cases in this way, with the greatest success; and his testimony is the more valuable, inasmuch as he was led to adopt the plan, from the repeated failure of the antiphlogistic system.

A variety of stimulating applications have been recommended by different writers, but any good effect,

* R. Argenti nitrat. gr. ij.—x.; ung. cetacci ℥j.; liq. plumb. acet., ℥x. Misce. It is known by the name of "Black ointment," and is employed with much advantage at the Royal Westminster Ophthalmic Hospital,—a small portion, about the size of a pin's head, being introduced beneath the eyelids, and diffused by friction over the globe. It might be compounded in smaller proportion than the minimum of Mr. Guthrie, and should always be prepared extemporaneously, as it is decomposed by long keeping.

which they are capable of producing, may be more certainly derived from the nitrate of silver.

M. Sonty states, in a recent communication to the French Minister of Marine, that he has derived the greatest advantage from the coagulum made by triturating the white of egg with alum; which is enclosed in a fine muslin bag, and a few drops of the liquid instilled into the eye repeatedly through the day—in some cases every half hour. He adopts this treatment in all stages of the disease, and, according to his account, generally accomplishes a cure in twenty-four or forty-eight hours. The undiluted liquor plumbi subacetatis, an article of similar properties, had been previously recommended by Mr. Vetch.

When the disease occurs in debilitated and lymphatic constitutions, a more moderate antiphlogistic course should be pursued, and it may even be necessary, in some circumstances, to support the general strength, while blood is abstracted locally from the temples. In protracted cases, also, a nutritious diet should be prescribed, in conjunction with alteratives and tonics, of which quinine is among the least irritating; and the same treatment, with the local application of the nitrate of silver, is also indicated in ulceration and sloughing of the cornea. Free ventilation is always beneficial; strict confinement to the chamber is at no time necessary; and in the latter stages of the complaint, the patient should be allowed daily exercise in the open air.

PURULENT OPHTHALMIA OF INFANTS.

Ophthalmia Neonatorum.

The purulent ophthalmia of infants generally makes its appearance a few days after birth, and, for all practical purposes, may be regarded as essentially the same with the disease just described. It arises, in most instances, from the contact of the vitiated vaginal secretion during parturition, but it may not improbably be produced also, by the action of light, heat, cold, and other agencies, upon the delicate organs of a newly-born child. In many cases the inflammation is confined to the palpebral lining, which is red, swollen, and highly injected; the impression of light is painful, and the secretion from the inflamed membrane concretes upon, and agglutinates the lids. In its severer forms, it is attended with a copious discharge of a thick puriform matter, sometimes mixed with blood, extreme vascularity of the conjunctiva, chemosis, tumefaction of the palpebræ, &c., &c. It generally commences in one eye, and, after a few days, attacks the other, but not unfrequently both are simultaneously affected.

When the inflammation is intense, and the eyelids very much swollen, difficulty is often experienced in examining the globe, and the morbid changes produced, may therefore exist for a time undetected. The disease is a very serious one, sometimes transcending in severity the highest grades of catarrhal ophthalmia, and destroys vision to a great extent in lying-in, and foundling hospitals, asylums, alms-houses, and other places in which a

large number of children are congregated ;—being communicated in such situations by inoculation from towels, sponges, &c., and its prevalence favoured by various concurring circumstances.

If properly treated from the beginning, the prognosis is generally favourable, the symptoms readily yielding to appropriate remedies ; but when this has not been the case, or where, from individual susceptibility, or greater intensity of cause, the inflammation assumes a more aggravated character, accompanied with much tumefaction of the lids, and chemotic swelling of the conjunctiva, there is reason to apprehend permanent injury from interstitial deposition, ulceration, sloughing, or staphyloma of the cornea, prolapsus and adhesion of the iris, occlusion of the pupil, &c., &c. An opaque condition of the cornea from thickening of its conjunctival covering, or lymphatic effusion into the subjacent cellular tissue, is a very common sequel ; but in many instances, owing to the comparative looseness of the texture of this part in early life, and the recuperative tendencies of youth, the lymph is absorbed before it has had time to become organized, and useful vision is often restored, when, from the extent of the opacity and other morbid alterations, recovery may have appeared quite hopeless.

Treatment.—In slight cases, where the inflammation is chiefly confined to the palpebræ, it will be sufficient to bathe the eye frequently with a sponge dipped in warm water, to drop upon the conjunctiva a solution of two grains of the nitrate of silver, to apply a little red precipitate ointment (p. 59) along the edges of the lids at night, and to direct an aperient of castor oil as circumstances may require. When, however, the symptoms are more violent, the eyelids swollen, and the disease, having ex-

tended to the globe, assumes a more formidable aspect, it will be proper to abstract blood by the application of one or two leeches to the temple or upper eyelid; or, where these cannot be procured, by scarification of the conjunctiva. In performing this trivial operation, one gentle stroke of the lancet along the turgid lining of the inferior palpebra is all that is required, and the eversion should be continued for a few seconds, in order to promote the hæmorrhage from the divided vessels. When leeches are employed, some care is necessary lest, owing to the extreme vascularity of the skin in these little patients, the punctures should bleed too freely. The eye should be frequently cleansed during the day, by expressing upon, or injecting over its surface, some slightly astringent collyrium,* and a solution of the nitrate of silver—the remedy of chief dependence in all cases of purulent discharge from the conjunctiva—in the strength of two or four grains to the ounce of water, applied by means of a quill, morning and evening.

At the tender age of which we are now speaking, the infant having just entered upon the threshold of existence, general depletion, except through the action of purgatives, is of course inadmissible; these, however, constitute an important part of the treatment, and a grain of calomel, blended with a drachm of castor oil, may be given with advantage at the beginning, and repeated occasionally during the continuance of the inflammation.

The disease, when it occurs in older children, is most commonly catarrhal in its origin, and the vital powers

* R. Liq. plumbi acetat., vin. opii, aa ℥xx.: aqua rosæ, ℥viij. Misce.

R. Hydrarg. bi-chlorid., gr. j.; vin. opii, ℥x.—xx.; aqua rosæ, ℥xij. M.

R. Alumin. sulphat., gr. xij.; vin. opii, ℥xx.; aqua rosæ, ℥xij. M.

being more fully developed, there should be a corresponding activity in the employment of constitutional measures.

Mr. Lawrence directs astringents, and observes that they are safer and more advantageous in this form of ophthalmic inflammation than in any other; the sulphate of alumine and the nitrate of silver are the two articles of this kind upon which he chiefly relies. Mr. Mackenzie prescribes a collyrium of the bi-chloride of mercury, three or four times in the twenty-four hours, and a solution of the nitras argenti, or of the sulphas cupri, in the proportion of four grains of the one, and six of the other, applied by means of a camel-hair pencil, once or twice daily, to the whole surface of the inflamed conjunctiva. When the puriform secretion is established, and there is reason, from the severity of the symptoms, to apprehend injury to the cornea, Mr. Walker recommends the nitrate in substance, and says that he has used it as frequently, and continued it as long in these cases as in others, and with the like salutary result. Mr. Guthrie employs the same article in the form of ointment.

A weak aluminous solution, sometimes preceded by the application of one or two leeches to the inflamed eyelids, constitutes the local treatment employed in a majority of cases at the Royal Ophthalmic Infirmary, Moorfields,—the nitrate of silver being never used in that institution; while the practice pursued at the Royal Westminster Ophthalmic Hospital, near Charing Cross, consists chiefly in the application of strong solutions and ointments of the nitrate of silver, which, though extremely painful in such young and tender subjects, are said to produce the most beneficial consequences. Such, ob-

serves Mr. Houston, is the difference of treatment in the two large ophthalmic hospitals of London.

A collyrium composed of the sulphate of zinc and sub-acetate of lead,* (Schmidt); a strong solution of the sulphate of zinc, (Saunders, Wishart, Blundell); the undiluted liquor plumbi sub-acetatis, (Vetch); the wine of opium, (Benedict); the sulphas cupri in substance, (Armstrong); and the insufflation of calomel, (Dupuytren); have all been employed in the treatment of this ophthalmia.

By Dr. Monteath and others, counter-irritation on the middle and posterior part of the scalp, or behind the ear, is mentioned in terms of high commendation; but the application of blisters in the cases of infants is not unattended with danger, and if any derivation of this kind be required, it will be more safely accomplished by an ammoniacal liniment, or some other rubefacient.

If the cornea should unfortunately lose its vitality—an alteration indicated by the dusky-white appearance of the dead portion of the membrane,—the sulphate of quinine must be exhibited in quantity of half a grain three or four times a day, a little wine whey prescribed, and such other means employed as may tend to support the failing powers of the system. Mr. Lawrence, following Mr. Saunders, recommends the resinous extract of cinchona, blended with milk, in the quantity of four to ten grains every four or six hours; but, to very young children the bulk of the vehicle would render it less easy of administration than the quinine.

* R. Zinci sulphat., gr. ij.; liq. plumbi subacetat., gtt. iij.; tinct. camphoræ, gtt. xij.; aqua distillat., 3j. M.

GONORRHŒAL OPHTHALMIA.

By most writers gonorrhœal ophthalmia is described as a distinct variety of inflammation, but the diagnostic symptoms are by no means strongly marked, and, with the exception of its cause, and the extreme vehemence of its attack, it does not appear to differ very materially from the severer grades of purulent or catarrhal conjunctivitis. Its existence may be suspected from its sporadic occurrence, the violence of its onset, invading at once the whole surface of the conjunctiva, the extraordinary rapidity of its progress, its general limitation to one eye, the tumefaction of the lids, excessive chemosis, and the profuse purulent secretion with which it is accompanied; but the history of the case, revealing the actual presence of gonorrhœa, or inoculation from that discharge in others, will furnish the only certain diagnosis. It seldom attacks both eyes simultaneously, and the one which becomes inflamed last in the order of time is probably affected by the morbid secretion from the other.

The disease arises from the direct application of gonorrhœal or leucorrhœal matter to the eye, and the consequences of the resulting inflammation are quite as serious as those which follow the most aggravated cases of purulent ophthalmia. It is, indeed, singularly violent and destructive, frequently terminating, notwithstanding the most judicious treatment, in ulceration or sloughing of the cornea, opacity from interstitial deposition, staphyloma, prolapsus of the iris, synechia anterior, or suppuration and collapse of the eyeball; and is so rapid in its

progress that vision is often irretrievably lost before application is made for surgical assistance. All the symptoms of vascular congestion are usually present in an intense degree, attended with agonizing pain and tension, hemicrania, intolerance of light, and severe constitutional disturbance. Some idea of the vehemence of this inflammation may be conceived, when it is stated, that of fourteen cases related by Mr. Lawrence, vision was entirely destroyed in nine, and, in three of the remaining five, there was partial opacity of the cornea, and anterior adhesion of the iris.

The treatment is the same as that recommended for purulent ophthalmia, and, if vision be not already destroyed, no time should be lost in carrying it into full operation. General and local depletion to an extent commensurate with the urgency of the symptoms, active purgatives, calomel and opium when the inflammation attacks the denser tissues, scarifications of the tumefied conjunctiva, and other auxiliary remedies, are proper in every instance; but the nitrate of silver is our principal dependence, and may be employed almost simultaneously with the depletory measures. The pencil, shaped to a point, should be applied to the chemotic swelling, or lightly drawn over the inner surface of the palpebræ, which are afterwards bathed with warm water before they are permitted to resume their contact with the globe. One such application is generally sufficient, and a solution of the nitrate, in the proportion of a scruple to the ounce, may be afterwards substituted, and gradually reduced in strength as the discharge lessens, and the inflammatory action subsides. Even Mr. Lawrence, who evinces unusual timidity in the employment of astringents, while he recommends the

freest adoption of the antiphlogistic system in constitutions which admit of such prescription, is constrained by the repeated instances of its failure, and the melancholy ravages of the disease, to assent to the more liberal employment of this article in the present modification of conjunctivitis; though he still speaks doubtfully of the practice. Of its use, however, either in substance or strong solution, he appears to have had no personal experience—rarely exceeding in his own practice the strength of four grains,—and his observations, moreover, have particular reference to the ointment of Mr. Guthrie.

Mr. Middlemore objects to the use of strong local stimuli in the commencement of the inflammation, but when the acute symptoms have been diminished by venesection and other means, the discharge has abated, and the florid vascularity of the conjunctiva is superseded by a pale flabby appearance of that membrane, he recommends the nitrate either in the form of ointment or strong solution. In most cases, however, such delay would be ruinous, for it is only in the early stage of the complaint, while the transparency of the cornea is yet unimpaired, that complete recovery can be expected from any treatment; and without thus waiting until the disease has produced organic changes which are irremediable, recourse should be had, after one large bleeding, leeching from the temples or cupping from the nucha, free scarifications, and the administration of a brisk cathartic,—remedies which may be employed in rapid succession,—to the nitrate of silver as above described.

Baron Dupuytren strongly advises the insufflation of

calomel once or twice a day, and the liquid laudanum of Sydenham dropped upon the eye at night.

When pus is effused into the anterior chamber, it may be expedient, in some cases, to puncture the cornea, in order to relieve the agonizing pain and tension attendant upon this unfortunate termination.

The directions given under the head of purulent ophthalmia respecting counter-irritation, fomentations, collyria, ointments, &c., preclude the necessity of further observations on these subjects here; but it may not be improper to remind the reader of the importance of tonic medicines and general invigorating measures, when,—all active inflammation having subsided,—the debilitated state of the patient, an atonic condition of the conjunctival vessels, or the occurrence of sloughing, and extensive ulceration of the cornea, indicate their employment.

STRUMOUS OPHTHALMIA.

Conjunctivitis modified by the lymphatic or strumous diathesis is a very common affection in some countries, where the people, inadequately supplied with food and raiment, are exposed to a cold and damp atmosphere, while they are often overtasked to procure the necessities of life, and subjected to various depressing influences. It is particularly prevalent in Great Britain, and the northern parts of Germany and France; but is much less frequent in the United States, though among the poorer inhabitants of our large cities—the foreign part of such population more especially—it is by no

means unusual. Though often observed in maturer age, it is properly a disease of childhood, a period in which the powers of the system are yet feeble and unconfirmed; and is hence generally met with from the first to the eighth or tenth year of existence. It is said not to attack infants at the breast, and this is perhaps true under ordinary circumstances, but the statement requires some qualification, since it is not of rare occurrence in weak, unhealthy children, when the process of lactation has been prolonged beyond the customary period.

Strumous ophthalmia appears under a variety of forms,—chronic conjunctivitis alone, or combined with phlyctenulæ or pustules, ulceration and opacity of the cornea, inflammation of the meibomian glands and ciliary capsules, excoriation of the tarsal margins, &c., &c.; and it sometimes happens that these several modifications either exist together, or occur successively in the same individual. It often coexists, or alternates with strumous affections in other parts of the body; is frequently complicated with porriginous and other cutaneous affections; and the morbid temperament in which it appears, exerts a modifying influence over inflammation arising from any accidental cause.

Symptoms.—Strumous ophthalmia is chiefly characterized by the trivial pain and redness, the fascicular arrangement of the vessels, profuse lachrymation, extreme intolerance of light, and the spasmodic contraction of the orbicular muscle, with which it is accompanied. The appearance of small pustules, pimples, or phlyctenulæ at the termination of the vascular plexus, on different parts of the conjunctiva, particularly around the cornea, is also a very common symptom, evincing

the analogy of the membrane to the dermoid tissue, and this modification is therefore described by some authors as a distinct variety. The sensibility to light is sufficiently remarkable to form a distinguishing sign of the disease; being frequently so excessive that the little patient will forego all his amusements, confine himself to the darkest part of the room, or bury his face in the bed-clothes, in order to escape from its intolerable impression. Any attempt to examine the eyes is attended with spasm of the orbicularis, sneezing, and a copious discharge of hot, acrid tears, which are both secreted in undue quantity by the preternaturally excited glands, and also prevented from escape by the involuntary closure of the palpebræ. In protracted cases, uncomplicated with affection of the tarsal margins, the cilia are longer than natural; and the habitual exertion to shield the suffering organ, imparts to the patient a peculiar appearance, which is almost pathognomonic of this form of ophthalmia. This extreme intolerance is sometimes absent in the pustular variety; and in many instances, exists almost alone, or is accompanied with very slight vascularity. It is quite independent of any inflammatory affection of the retina,—vision, except in so far as it may be affected by opacity of the cornea, being unimpaired in the shade, and in the dusk of evening,—and may be regarded as a neuralgic affection of those branches of the fifth nerve which are the source of common sensibility to the impression of light. A peculiar trait of strumous conjunctivitis is the occurrence of the exacerbations in the morning, and of the remissions in the evening,—the reverse generally happening in the other ophthalmiæ. The redness, rarely proportionate to the other symptoms, is more properly fascicular than

diffuse; and, as already stated, a minute pustule or pimple is frequently observed at the termination of each plexus of vessels, which in the progress of the complaint may either subside, or degenerate into the ulcerative process. In other cases, the dilated capillaries extending over the cornea, inosculate with each other, and produce by lymphatic deposition more or less thickening and opacity of its texture. When the bulbs of the cilia are involved, the eyelashes fall out, and are often replaced by others of dwarfish growth and wrong direction, which aggravate and prolong the inflammation by the irritation which they occasion. The edges of the palpebræ are frequently inflamed, ulcerated, and the seat of a troublesome pruritus; and excoriations about the nostrils, discharges from the nasal and auditory passages, eruptions upon the head and face, glandular enlargements, &c., are likewise occasionally present. The usual indications of gastric or intestinal derangement exist in many cases in greater or less degree, with tumid abdomen, anorexia, restlessness, debility, &c.; and the disease—often intractable under the most judicious treatment—is extremely liable to sudden change and relapse from slight causes.

Though slower in its progress, the ultimate consequences of strumous ophthalmia are often not less serious than those resulting from some of the other forms of conjunctivitis; for, like them, it may involve the more deeply-seated tissues, and terminate in ulceration of the cornea, opacity from pustule, vascular thickening, or interstitial deposition, hypopium, prolapsus and adhesion of the iris, staphyloma, hydrophthalmia, &c., &c.

Causes.—Strumous ophthalmia may be excited in persons possessing this morbid peculiarity of constitu-

tion, by exposure to the ordinary causes of simple conjunctivitis,—cold, atmospherical vicissitudes, innutritious diet, want of exercise, confined and impure air, dentition, gastric or intestinal irritation, cutaneous eruptions, &c., &c. It is very liable to occur in debilitated states of the system, especially when induced by causes which involve the mucous and cutaneous tissues, and is hence a frequent sequel of catarrhal ophthalmia, and of the various exanthemata—small-pox, measles, scarlatina, &c.

Treatment.—This variety of inflammation is almost invariably connected with an atonic or irritable condition of the system; and the constitutional treatment is therefore a consideration of paramount importance. It frequently happens, indeed, that no impression can be made upon the local affection until the general dyscrasia has been corrected. There is often much functional derangement of the chylopoietic viscera, the secretions of the intestinal canal are perverted, and the bowels loaded with unhealthy accumulations; in addition to which, the patient is fretful and irritable, with anorexia, feverishness, and other symptoms of indigestion. This state of things must, of course, be removed before those remedies which are more especially adapted to the complaint can be prescribed with any reasonable prospect of advantage. A change to a purer atmosphere, with a regulated diet, proper clothing, an active aperient of calomel with rhubarb or the compound extract of colocynth, and the daily use of the warm bath, will often produce an immediate and strikingly beneficial effect among the children of the poor, who live in crowded courts and ill-ventilated apartments; and, in admitting such patients into the Wills Hospital,—which combines

in a high degree every hygienic requirement—it is the practice of the author, where no organic mischief is impending, to await for a few days the operation of these sanative influences before instituting any local treatment.

When symptoms of gastric disorder are present, an emetic should be administered in the first instance, followed, at proper intervals, by one or more brisk cathartics. Much attention to the condition of the digestive organs will be required through the whole progress of the disease, and mild aperients—calomel and rhubarb, the tincture or compound decoction of aloes, sulphur with the bi-tartrate of potash, and anthelmintics when there is reason to suspect the presence of worms,—often constitute an essential part of the treatment. If there be much febrile excitement, the neutral mixture, with antimony in quantity sufficient to produce some impression upon the circulation, may be advantageously directed, and, in irritable constitutions, will often prepare the way for the exhibition of tonic medicines which would not otherwise have been borne.

In recent acute cases, where the inflammatory symptoms are considerable, and the strength not much reduced, leeches to the temples are also indicated, and, in smaller numbers, their application may be repeated during the occasional exacerbations and relapses to which the complaint is subject. Local depletion, however, must not be carried too far, and should rather be prescribed to avert threatened organic alteration, than with the view of relieving the photophobia, which, being a mere sympathetic affection, depending probably upon some derangement of the alimentary canal, would be aggravated by whatever might increase the existing de-

bility. No little tact, indeed, is often evinced both in discriminating the proper cases for its employment, and in determining the degree to which it should be carried: for while, on the one hand, destructive inflammation may occur in enfeebled as well as in opposite states of the system, demanding the prompt employment of antiphlogistic measures, more especially when the denser tissues become implicated; there is danger, on the other, of unduly depressing the vital energies, and thus impairing the power both of resisting morbid action, and retrieving the consequences which it induces. No rule can be given which shall supersede the exercise of a sound discretion; the surgeon must be guided by the circumstances of each particular case; but when the line of conduct is doubtful, medicines—the tartrate of antimony, nitre, colchicum, &c.,—which control arterial action without permanently diminishing the strength of the patient, furnish a useful alternative, and, judiciously directed, may either avert the necessity for the abstraction of blood, or lessen the quantity which must otherwise have been drawn. The atony and congestion which characterize strumous conjunctivitis are frequently mistaken for indications of sthenic action, and it is melancholy to witness the privation and suffering which are sometimes inflicted under this erroneous impression, often aggravating the disease, and impairing still further an already enfeebled or depraved constitution.

The great object to be pursued in the management of this ophthalmia is the invigoration of the system, and though, in some cases, circumstances may temporarily require the prescription of local measures of a different character, this should be steadily kept in view. A light, nutritious diet, regular exercise in the open air, the tepid

salt, or shower-bath, followed by frictions over the surface with the flesh-brush or a coarse wet towel, and whatever has a tendency to promote the proper performance of functional action, will be eminently conducive to this end; and, in the enervating weather of summer, a removal to the sea-shore often succeeds in accomplishing a cure after almost every other means has failed.

In fulfilment of the general indication, the sulphate of quinine is an important remedy, and often displays a very decided influence in allaying the morbid irritability, relieving the photophobia, and removing the inflammatory symptoms. To children, it may be readily exhibited in syrup, and in quantity varying according to the urgency of the case, and the age of the individual;—half a grain or a grain, two or three times a day, being a suitable proportion for an infant one or two years old. For adults, it may be appositely combined with the tincture of cinchona, or given in the form of pill, with myrrh and the dried sulphate of iron, and its operation assisted by any light bitter infusion. Iodine is both a stimulant to the absorbent system, and a valuable corrective of functional derangement, and may be employed in substance, dissolved in minute proportion, in the syrup of sarsaparilla, alone, or conjoined with quinine, the compound tincture of cinchona, the tinctura aloes et myrrhæ, &c., according to the indication to be fulfilled. The iodide of iron is much prescribed by some practitioners, and is often productive of salutary effects; the iodide of potass—also a useful preparation—is better suited to the earlier periods, or more active forms of the complaint. The chalybeates, generally, are well adapted to the anæmic and debilitated states of the system, in

which this variety of ophthalmia so frequently appears; the precipitated carbonate of iron, with columbo, is an excellent prescription for adults, and, given alone, it furnishes, from its tastelessness, an article of convenient exhibition for children. The author is informed by his friend and colleague, Dr. Parrish, that he has, of late years, been much in the habit of prescribing this, and kindred preparations of iron, and with increasing confidence in their remedial powers. Decoctions of *climaphila*, *cimicifuga*, and articles of similar properties, are also occasionally useful.

One reason of the frequent relapses to which this ophthalmia is subject, is the discontinuance of the treatment before the blood has recovered its healthy crasis, and the system acquired such a degree of tone as will enable it to resist the operation of the morbid causes to which it is exposed. A chronic complaint necessarily implies a chronic remedy, and the ferruginous combinations especially, which require time to produce their full influence, should be perseveringly employed long after the local symptoms have disappeared.

A solution of four grains of the nitrate of silver dropped upon the eye at intervals of one or two days, has a marked effect in mitigating the irritability, constringing the vessels, and restoring the healthy condition of the conjunctiva; and may also be usefully employed when pustules or phlyctenulæ are present. In the more indolent stage in which ulceration commonly appears, a stronger solution may sometimes be required, and should be applied directly to the part by means of a camel-hair pencil. In chronic cases, where vascular congestion is the prominent symptom, the *vinum opii*,

diluted or otherwise, is a useful prescription, and the ointment of red precipitate (p. 59), may likewise be advantageously applied to the edges of the lids at night.

Tepid fomentations are most grateful to the feelings of the patient, and in slight cases any gently stimulating or astringent lotion may be employed for that purpose. When the intolerance of light is more considerable, accompanied with spasmodic contractions of the orbicularis, anodyne collyria, as hot water with laudanum and the liquor plumbi subacetatis, stimulating frictions around the orbit, or the vapour produced by adding a drachm of the tinctures of opium and camphor to a tea-cupful of boiling water, will frequently afford relief. Warm saturnine poultices at night are sometimes useful under such circumstances, and the watery solution of opium, or the decoction of lettuce as recommended by Demours, may be appropriately employed in their preparation. For the removal of these symptoms, which, being neuralgic in their character, disappear as the healthy condition of the system is restored, Baron Dupuytren appears to have relied chiefly on the internal exhibition of belladonna; and the extract of hemlock in quantity of a fourth of a grain to two grains daily, according to the age of the patient, gradually increased in some cases to ten or fifteen grains, is strongly recommended by Dr. Stocber and others.

Counter-irritation is thought by some writers to be more serviceable in strumous ophthalmia than in most other forms of conjunctivitis, and, prescribed with due discrimination, it often evinces a prompt effect in abating the intolerance and other symptoms; but the crethism which, in weak and irritable habits, sometimes follows its employment, more than counteracts the good effects

which might otherwise be expected, and it is hence employed by the author much less frequently than formerly. A blister behind the ear, on the back of the neck, or on the arm, is the ordinary mode of producing it; Mr. Lawrence prefers frictions between the shoulders with the tartrate of antimony; and in adult age, when the complaint is protracted and subject to frequent relapse, the more permanent form of seton or issue may be substituted.

If, as sometimes happens, the disease should continue to advance, uninfluenced by the means employed to check its progress, producing opacity of the cornea from lymphatic deposition, threatening disorganization of its structure, and involving in its progress the deeper tissues of the eye, recourse must be had to the alterative use of mercury. Under proper restrictions the exhibition of this article is not necessarily attended with danger even in strumous constitutions, and, like the local abstraction of blood when indicated by the acuteness of the inflammatory symptoms, is entirely compatible with the continuance of means adapted to support and invigorate the system.

It has been already stated that this form of ophthalmia is extremely variable in its progress, and subject to frequent exacerbations and relapses from atmospherical vicissitudes, irregularities in diet, &c.; the knowledge of these circumstances, will prevent the too early relinquishment of remedies, and indicates the necessity of continued attention to the due performance of the cutaneous and digestive functions, the use of adequate clothing, and the adoption generally, of strict precautionary measures during the period of convalescence.

There is rarely any necessity for confining the patient

to a darkened apartment, or for having the eyes closely covered,—a light shade of green silk affording quite sufficient protection, and even this not being required in most cases. When the photophobia is very considerable, the use of blue French goggles, the bowl of which is formed of fine woven wire to allow the passage of the air, may so far moderate the painful impression of light as to admit of exercise without doors,—a consideration often of much importance in the treatment.

VARIOLOUS OPHTHALMIA.

The conjunctiva though it differs materially from the cutis in its anatomical structure, yet being continuous with that membrane, participates in its diseases, and is especially liable to become inflamed in the several exanthemata. Various morbid degenerations—ophthalmia tarsi, alopecia, trichiasis, chronic inflammation of the lachrymal sac, &c., &c.,—often follow the variolous eruption when its action is confined to the eyelids; but the implication of the transparent tissues, either during the prevalence of the general symptoms, or afterwards, is a much more unfortunate occurrence. Petechiæ are sometimes seen beneath the conjunctiva, and the degree of its participation in the intense cutaneous excitement, may vary from slight vascularity to a high grade of inflammation. Modern writers of extensive experience in the management of small-pox, deny the occurrence of pustules on the cornea during its eruptive stage,—the affection hitherto so regarded, consisting in common inflammation of a grave and somewhat peculiar character, which makes its appearance soon after the com-

mencement of the secondary fever. It is described as being attended with comparatively little pain, passing rapidly into the ulcerative process, and bearing some analogy to the mortification of different parts of the body which occasionally follows the great depression of the vital powers produced by diseases of malignant type,—scarlatina, erysipelas, typhus fever, &c. Owing to the turgidity of the lids, and the violence of the constitutional disorder, the condition of the organ is sometimes not discovered until the mischief is irremediable; and so destructive is the inflammation, that even in cases where the most judicious measures have been employed from the beginning, vision is frequently lost or impaired by interstitial deposition, ulceration, suppuration, or sloughing of the cornea.

The treatment must be conducted, as far as practicable, on the principles applicable to ophthalmic inflammation, with due regard to the state of the system in which this unhappy complication appears. Leeches, warm fomentations, and such general measures, antiphlogistic or tonic, as circumstances may require, are the remedies chiefly entitled to confidence. When the ulcer is spreading, and the tumefaction of the lids will admit of topical applications, the nitrate of silver in strong solution should be applied to its surface.

There is, however, a secondary, and evidently pustular form of the disease, more common in its occurrence, which usually makes its appearance some time, often several weeks, after the eruption has disappeared; and though less dangerous than the preceding variety, vision is often seriously impaired by the resulting opacity. The pustule appears to be seated in the sub-conjunctival cellular tissue, and its tardy developement may be explained

by the denser texture and slighter vascularity of this part. One or more whitish spots, surrounded by an opaque halo, are observed upon the cornea, usually near its circumference, which gradually increase, assume a yellowish hue, and are accompanied with the usual symptoms of ophthalmia,—pain, redness, intolerance of light, lachrymation, &c. If the inflammation be not arrested, ulceration commences at these points, and spreads superficially towards the centre of the membrane, sometimes occupying the whole apex of its convexity. In other instances, it affects also the proper lamina of the cornea, suppuration follows, and the ulcerative action extending, penetrates the chamber, and involves the internal parts of the eye. In both cases the loss of substance is supplied, as the ulcer heals, by lymphatic exudation, and when the pustules are large and deeply seated, the entire surface is rendered albugineous; under other circumstances, however, it often cicatrizes with less opacity than might have been anticipated.

The debility induced both by the variolous disease and the means employed for its removal, may modify to some extent the supervening inflammation, and obviate the necessity for such active antiphlogistic measures as might otherwise be required. The topical abstraction of blood by leeches from the temples, and the exhibition of one or more active saline cathartics, will always be proper in the incipient stage, and even venesection may possibly be indicated in some instances; but in ordinary cases the circulation may be sufficiently controlled by the tartrate of antimony in combination with the neutral mixture. Mercury, cautiously carried to the production of a slight constitutional impression, is often serviceable

in removing the lymphatic effusion, and the nitrous powders, fulfilling several indications, furnish an appropriate formula for its administration.

After the active symptoms have been subdued by these means, there may be a gradual restoration of healthy action; but if otherwise, and there is reason to believe that the complaint is protracted by an atonic condition of the system, the sulphate of quinine should be directed, either alone or in conjunction with other tonics, and such general measures adopted—an improved diet, exercise in the open air, change of scene, &c.,—as may recruit and invigorate the depressed energies of the constitution.

In the ulcerative stage, the nitrate of silver, in the strength of four grains to the ounce, is the best local application; and if the inflammation be aggravated and prolonged by the irritability of the ulcer, a stronger solution may be applied directly to the part by means of a camel-hair pencil: under other circumstances the *vinum opii* is often preferable.

When the disease has assumed a chronic form, and especially when it has quickened into action the strumous diathesis, tonic and alterative medicines, as the sulphate of quinine, the carbonate of iron, and the preparations of iodine, may be prescribed with advantage. Dr. Stoeber recommends a formula composed of one part each of calomel, and the golden sulphuret of antimony, and two of pulverized conium, in the quantity of from two to six grains, twice a day, according to the age of the patient;—the compound calomel, or Plummer's pill, which it so nearly resembles, would probably be equally efficacious.

The inflammation which accompanies measles and

scarlatina, being rather catarrhal or blenorrhœal than pustular, is more superficial and less dangerous than that produced by variola; and requires a treatment differing in no respect from that pursued in the other forms of conjunctivitis. The palpebræ may be occasionally bathed with warm water, some mild saturnine ointment applied at night to the ciliary margins, and, if the discharge be considerable, a solution of the nitrate of silver dropped at proper intervals upon the eye. Aperients and pediluvia will always be proper; and in severer cases, leeches may be applied to the temples, counter-irritation excited, and such other measures adopted as circumstances shall indicate. The several forms in which strumous ophthalmia appears are, as elsewhere remarked, not unfrequent sequelæ of these exanthemata.

GRANULAR CONJUNCTIVA.

A change of structure in the mucous lining of the palpebræ is a very frequent consequence of violent or neglected purulent ophthalmia, and sometimes exists unsuspected, occasioning by the constant friction of the lids upon the globe, a chronic kind of inflammation, intractable by the means employed in simple conjunctivitis, and terminating, if not relieved, in thickening, vascularity, and opacity of the cornea. The health of the patient is often impaired by the protracted suffering to which he is subjected, and the irritation, always present in greater or less degree, is liable to paroxysms of severe aggravation from exposure to cold, atmospherical vicissitudes, and other causes;—the inflammation thus produced, developing still further the morbid condition of

the lids, and tending with accelerated progress to the impairment or destruction of vision, by lymphatic deposition between the laminæ of the cornea, ulceration, prolapsus of the iris, synechia anterior, staphyloma, &c. This peculiar alteration of the membrane occurs under a variety of forms, and in different gradations; from slight thickening and vascularity of the part,—the mere exaltation of its villous texture—to the production of fungous excrescences of considerable magnitude. It is most conspicuous in the upper eyelids, and when these are everted, their inner surface as far as the orbital edge of the tarsus, is observed to be thickly covered with little acini or grains, while its continuation towards the globe presents a rough, vascular, and otherwise diseased appearance. These granules are about the size of a millet seed, and are often congregated or crowded together in small parcels, which are in close contact with each other, but separated by clefts or fissures, that gape and bleed when the lid is turned backwards. The surface which they form, is sometimes not unlike that of a mulberry, and may be pale, hard, and resistent, when the granules are small and numerous, or soft, florid, and spongy, when they are large and comparatively few;—their colour being chiefly determined by the degree of vascular turgescence. In some aggravated cases the membrane exhibits an ulcerated appearance, being covered with a purulent secretion, and diversified with fungous growths and inequalities.

These various changes in the interior surface of the lids, destroying their exquisite smoothness and perfect adaptation to the globe, depend upon several pathological alterations:—in some instances the lesion appears to consist principally in a vascular developement or hyper-

trophy of the minute papillæ of the conjunctiva, with, perhaps, some degree of interstitial deposition within its texture ; and, in others, of an enlargement of the mucous or meibomial follicles, which are not only more numerous in that portion of the membrane lining the tarsal cartilage, but are rendered more prominent there, by reason of the hard unyielding plane on which they are situated.

Treatment.—Where the conjunctiva is very tumid and florid, the turgescence of its vessels may be relieved in the first instance by scarification ; but this preliminary measure is rarely necessary, and, in most cases, recourse may be had at once to the application of the sulphate of copper. A smooth, compact crystal is selected, cut into a wedge-like shape, and fixed in a quill ; the lid is then everted, and the crystal, dipped in water to insure its partial solution, is passed a few times over the diseased surface,—a soft, wet sponge, or fold of linen, being applied to the part before it is permitted to resume its position, in order to absorb the superfluous particles, and thus prevent unnecessary irritation of the globe. The operation is productive of more or less pain, often, however, trivial, and lessening with each repetition, which should be made at intervals of two or three days. As the morbid condition of the membrane is removed, its sensibility returns, and lighter applications are required ; or a solution of four or eight grains of the nitrate of silver may be substituted, and applied by means of a camel-hair pencil. In some instances, these two articles may be advantageously alternated at periods of one or two weeks ; parts accustomed to the action of any remedy being benefited by change.

The treatment just detailed is that commonly adopted at the Wills Hospital, and, when steadily pursued, is

generally successful in effecting a cure. It should be borne in mind, however, that the alteration in question is often of very chronic character; it may have existed for years before proper measures are instituted for its relief; and the disease, being thus confirmed by long habit, can only be overcome by the persevering employment of means which produce little reaction and gradual improvement. The use of strong escharotic applications, as the caustic potash in solution, the mineral acids, &c., cannot be too strongly condemned; they destroy the texture of the membrane, impair its secretory functions, and often protract indefinitely, or render altogether impracticable, a recovery which might otherwise have been slowly but surely accomplished.

Sometimes, though very rarely, when the granules are unusually large, a remedy of greater potency is required, and a solution of the nitrate of silver, in the proportion of a scruple or half a drachm to the ounce of water, may be employed; or a cylinder of the nitrate, sharpened to a point, may be drawn lightly and rapidly across the part, which should be immediately bathed with the sponge. When used of this strength, it generally occasions much irritation, and the applications should, therefore, be made at longer intervals than those of the sulphate of copper; to which recourse should be had as early as possible. If the morbid state of the membrane is not very fully developed, its surface being still rather villous than granular, a solution of four, six, or ten grains of the nitrate of silver may be employed from the commencement.*

* The stain so frequently left by this article on the hands of the surgeon may be promptly removed by a strong solution of the iodide of potash.

Counter-irritation, by blister behind the ear or on the arm, is sometimes a useful auxiliary; though the erethism which it induces frequently neutralizes its good effects. Excision of the granulations, except, perhaps, when they are large, sparse, and peduncular, is apt to produce permanent irregularity by the cicatrices which it occasions, and had, therefore, better be dispensed with.

The disease frequently occurs in lymphatic or strumous individuals, and may be attended with an irritable condition of the system, suppression of the catamenia, derangement of the digestive organs, or general debility. In such cases, the improvement of the general health is an indication of primary importance; and in proportion as this is accomplished, the dilated vessels recover their tonicity, and the abnormal condition of the conjunctiva, which had previously resisted the best-directed exertions, gradually disappears either spontaneously, or under the use of the sulphate of copper, or some mild astringent collyrium. In these circumstances, the irritation is sometimes protracted by the *nimia diligentia medici*, as evinced in the too persevering employment of local applications; and benefit is derived from their temporary suspension, or gradual abatement. Repose of the eye, and protection from injurious influences, exercise without doors, sea or country air, with due attention to diet, clothing, &c., will always constitute an important part of the treatment.

A case which came under the care of the author a few years ago at the Wills Hospital, is strikingly illustrative of the beneficial effects of the remedies employed. The irritation produced by the constant friction of the granulated lids upon the globe, aggravated by occasional excitements into severe inflammation, had terminated in

vascularity and opacity of the cornea; the conjunctival covering of which was so much thickened by interstitial deposition and vascular congestion, as to appear like a congeries of red vessels, entirely concealing the iris and pupil. So complete, indeed, was the obscuration, that, during a period of several weeks, the patient was unable to distinguish light from darkness. He had been in charge of several physicians, by whom the sulphate of copper and other remedies had been very properly employed; but, owing to repeated relapse, no permanent advantage had been gained. Notwithstanding the unpromising aspect of the case, it was successfully treated, and useful vision restored, by occasional scarification of the lids, followed by the application of the solid nitrate of silver, and subsequently of the sulphate of copper, and several of the articles mentioned below; in conjunction with appropriate general measures calculated to improve and invigorate the system.

The vascular and opaque condition of the corneal conjunctiva, denominated *pannus*, is a frequent consequence of the affection just described, and may also be produced by incurvation of the tarsal cartilage, misplaced or inverted cilia, or any other source of protracted irritation. In all such instances, after the removal of the cause by the measures already indicated, the cornea, unless its proper lamina have become involved and its texture consolidated by the long continuance of the inflammation, tends spontaneously to resume its transparency. The process of recovery, however, may be greatly accelerated by various stimulating applications; and ointments of red precipitate, creosote, and the nitrate of silver; the vinum opii and the liquor plumbi subacetatis; and solutions of the nitrate of silver, and the sul-

phates of copper, zinc, cadmium, and alumine, have been usefully employed in different cases. Under circumstances of little irritability, a collyrium of the muriate of copper,* or of rose water acidulated with acetic acid, applied by means of an eye-glass, may likewise be occasionally prescribed with advantage.

Excision of a portion of the enlarged vessels when they are distinct and prominent, may, perhaps, be expedient in some instances; but this is at best a doubtful measure, and is not unfrequently productive of violent irritation.

Vessels circulating red blood are sometimes seen on the cornea, and are generally seated either in its conjunctival covering, or in the subjacent cellular tissue. They have originally been connected with ulcer, albugo, strumous corneitis, or the morbid conditions which have just been described, and frequently remain long after the original cause has ceased to operate. The treatment consists in the employment of various local stimuli and astringents; as a solution of the sulphate of copper, the vinum opii, liquor plumbi sub-acetatis, &c. The excision of the vessels in their passage over the conjunctiva, recommended by some authors, is rarely required, and, as already stated, often aggravates the mischief it is intended to remove.

* R. Ammon. muriat., ℥ij.; cupri acetat., gr. iv.; aqua calcis, ℥viij. Misc, stent per horas viginti quatuor et cola.—*Scarpa*. It should be employed at first in still greater dilution.

ULCER OF THE CONJUNCTIVA.

Ulceration of the cornea has been frequently mentioned as a consequence of the several varieties of inflammation, simple, strumous, &c.; it is particularly common in the mixed form of catarrho-rheumatic ophthalmia, and often appears to be nothing more than an abrasion or excoriation of its conjunctival covering. The ulcer is not usually followed by any considerable degree of opacity, though in a few instances a slight cloudiness may remain for some time after it has healed;—more commonly a little facet or depression remains to designate the spot which it occupied.

These superficial ulcerations generally heal without difficulty, as the vascular excitement which produced them is removed by the employment of the appropriate remedies. When they are connected with a debilitated or congested condition of the vessels, a solution of the nitrate of silver, varying in strength according to the irritability of the part, and the internal exhibition of the sulphate of quinine, or some other tonic, will prove serviceable. In some instances it may be expedient to change the application, and a solution of the sulphate of copper or zinc may be substituted with advantage. The application of the nitrate of silver, in substance, can never be required in these cases, and much harm has been done by its indiscriminate employment.

PTERYGIUM.

Pterygium is a vascular thickening of a portion of the conjunctiva, usually situated upon the nasal side of

the eye, and unattended in its earlier periods with any uneasiness, except perhaps a slight irritability of the organ. Its base is towards the periphery of the globe, and it becomes narrower as it advances upon the cornea, where the increasing density of the conjunctiva, and its more intimate connexion with the parts beneath, together with the action of the palpebræ, oppose greater resistance to its lateral extension, and cause it to assume a triangular shape. It has also been suggested that this conformation may be owing to the supply of blood from different sources, each of which nourishes one-fourth of the membrane, and is to a certain extent independent of the others,—an explanation which derives some plausibility from the circumstance, that, though generally growing from the inner canthus, pterygia may appear on either of the other divisions, and have even been seen on all at the same time,—the points of the abnormal productions converging upon the cornea and destroying vision by their junction. The pterygium is loosely attached to the eyeball, and may be easily raised with the forceps. In some instances the apex of the morbid growth is elevated, reddish, and vascular, while its base, or the part situated on the sclerotica, exhibits a more fibrous appearance, and is scarcely raised above the level of the conjunctiva. According to Mr. Middlemore, who has dwelt upon this subject with more than his accustomed prolixity, it is not seated in this membrane, but has its origin in a partial hypertrophy of the subjacent cellular tissue, which acquires a flattened form in consequence of the pressure to which it is subjected from the action of the lids,—the attenuated conjunctiva being reflected over it much in the same manner as the viscera are enclosed in the folds of the pleura or perito-

neum. The disease is very slow in its progress, often continuing for many years without any perceptible advancement, and exists in two principal varieties, the thin and membranous, and the thick, vascular, or fleshy; both of which exhibit more or less of a fibrous character, and are unattended with pain, or any inconvenience, except that which results from their size and encroachment upon the cornea, obstructing vision.

Pterygium is generally observed in middle or advanced life, and appears in some instances to be dependent upon gastric derangement; but more commonly occurs without any assignable cause. By some writers it is attributed to long-continued irritation from minute particles of lime or dust, in those whose occupations expose them to the action of such irritants; and, according to Mr. Lawrence, it is most frequently met with in persons who have been long resident in warm climates.

Treatment.—So long as the disease is confined to the sclerotica no interference is required; but when it evinces a disposition to encroach upon the transparent tissues, it becomes necessary to adopt measures for its removal. The membranous variety may be excised, by raising it with the forceps, and cutting it away in the direction of its fibres by means of the curved scissors;—the patient meanwhile being placed upon his back, and the lids separated by an assistant. If the pterygium is thick and fleshy, it will be better to elevate it as before, and, passing a small pointed scalpel between it and the sclerotica, near its base, to separate it from its connexions towards the cornea in the first instance, and afterwards to detach it with the scissors,—taking care not to approach within a line of the valvula semilunaris.

Mr. Mackenzie, raising the pterygium near its base, divides it with a vertical incision with a small scalpel, and then shifting the forceps to the apex, cautiously dissects it from the cornea and sclerotica.

TUMOURS OF THE CONJUNCTIVA.

Small tumours, termed pingueculæ from their appearance, sometimes grow from different parts of the conjunctiva. There is also another variety, having a red, spongy, and vascular texture, attached to the globe by a central peduncle, and presenting a slightly convex or flattened surface, in shape not unlike to a minute mushroom. They rarely occasion much inconvenience, unless so situated as to interfere with the motion of the upper eyelid; but, if desirable on account of the deformity, may be readily excised with the forceps and scissors. Little verruculous excrescences also occur in the same situation, and are removed in like manner; or, if their base be more extensive, by means of a small scalpel.

Congenital productions of larger growth and various consistence, are occasionally observed on the anterior part of the eye; and hairs are sometimes seen growing from their surface. They appear to originate in the conjunctiva; though they may ultimately involve the denser tissues, and if they produce much irritation, or threaten to encroach upon the cornea, should be removed by excision.

Messrs. Watson, Mackenzie, and others, describe a fungous condition of the conjunctiva, which, in some instances, resists the repeated application of the nitrate

of silver, and yields only to the knife. In three cases which fell under the care of the gentleman first mentioned, it was deemed expedient, from an apprehension of their malignant character, to extirpate the eye; but on dissection the fibrous tunics and the internal parts of the organ were ascertained to be quite unaffected. Excision of the morbid growth should not be too long delayed under these circumstances, as the eyeball is liable to become implicated in the progress of the disease:—the operation may be facilitated by dividing the external commissure.

A relaxed or flabby condition of the conjunctiva sometimes remains after the severer grades of purulent ophthalmia; but, in general, the membrane resumes its natural state of close application to the globe, as the part regains its healthy action under the use of tonic medicines, and the employment of stimulating and astringent collyria.

XEROSIS.

Conjunctiva Arida.

There is a singular affection described under the title of xerosis, or cuticular conjunctiva, in which that membrane loses its soft and mucous texture, and becomes dry, shrivelled, and almost insensible. The iris and pupil, if not altogether concealed, are dimly visible through the opaque conjunctiva, which has a dirty-white, or dead appearance; and the palpebræ are either partially everted, or adherent to the globe and to each other. It is a disease of rare occurrence, and little is known respecting its etiology. It is sometimes seen

as a consequence of chronic inflammation which has destroyed the secreting property of the membrane, and must not be confounded with the xeroma, or xerophthalmia of the ancients, with which indeed it has few symptoms in common. By Mr. Travers, it is attributed to an obliteration of the lachrymal ducts, but this cause would not be adequate to the production of such an effect, and, moreover, does not always exist. Dr. Stoeber with greater plausibility ascribes it to thickening of the epithelium of the conjunctiva.

DISEASES OF THE CORNEA.

CORNEITIS.

As a secondary affection, caused by the extension of inflammation from the other tissues, corneitis is a frequent complication of several of the ophthalmiæ; it occurs also as an idiopathic disease, originating sometimes, without any assignable cause in strumous constitutions, or in enfeebled conditions of the system, and at others, more acutely induced by the variolous contagion, and injuries of various kinds, chemical and mechanical: it is not unfrequently seen as a consequence of the prolonged irritation occasioned by particles of metal which have become embedded in the membrane; happily however, the cornea is indisposed to assume inflammatory action from penetrating wounds, and the effects of such mischief, so far as they relate to that tunic, are, in general, soon repaired.

ACUTE CORNEITIS.

When inflammation of the cornea is produced by accidental causes, the conjunctiva also participates in the irritation, and the disease is compounded of the symptoms peculiar to each tissue. The redness, masked by the conjunctivitis, assumes a zonular appearance, more or less complete according to the severity of the injury and the violence of the reaction, around the anterior part of the sclerotica;—the dilated vessels not leaving,

as in iritis, a whitish line immediately encircling the cornea, but being continued over the surface of the membrane, where they are often so minute as to be scarcely visible without the aid of a magnifier. The cornea loses its transparency, and becomes opaque at the injured part, where a small abscess appears; or ulceration takes place without previous suppuration. If the cause has been so severe as to destroy its vitality—a frequent effect of contusion produced by particles of stone or coal—the resulting inflammation is very acute; and the patient complains of a deeply-seated pain in, and around the orbit, intolerance of light, hemicrania, sleeplessness, &c. The slough in these cases, though partial at first, generally involves the entire cornea, and is easily recognised by its dusky-white appearance, not unlike that of soaked leather. Its formation is sometimes preceded or accompanied by the effusion of pus into the anterior chamber; when it separates, the iris protrudes through the opening, and the part heals by the adhesion of this membrane to the remaining portion of the cornea,—sufficient firmness being thus produced to preserve the general form of the eyeball.

When the cornea is implicated during the variolous eruption, the inflammation passes rapidly into the ulcerative or sloughing process; followed by their usual consequences, prolapsus iridis, synechia anterior, staphyloma, &c. In secondary variolous ophthalmia, which has already been described as a disease of the conjunctiva—that membrane being primarily and chiefly affected—the symptoms are less urgent; lymph is effused in the first instance, suppuration follows, and the pustule degenerates into the ulcerative process.

The treatment of acute corneitis has been sufficiently

detailed in the outline given of the several affections of which it is an attendant. General and local depletion, mercury carried to the production of slight pyalism, purgatives, antimony, refrigerating lotions, abstinence, &c., are the appropriate remedies; and in many instances promptly succeed in arresting the progress, and removing the effects of the disease. When, notwithstanding the judicious and adequate employment of these depletory measures, the inflammation assumes a chronic form, —the eye continuing lachrymose, irritable, and intolerant of light,—a debilitated condition of the system is often the cause of its protraction; and the sulphate of quinine, with an improved diet, and a general invigorating regimen, will be required.

The morbid action is not unfrequently propagated to the iris, and particular inquiry should therefore always be made into the state of this part.

STRUMOUS CORNEITIS.

The idiopathic form of this inflammation, already alluded to as occurring in children and young persons of lymphatic temperament, is familiarly known under the appellation of strumous corneitis. It is commonly indolent in its character, attended oft-times with little vascularity, and appears to affect primarily the conjunctival covering of the cornea.

A dull or turbid appearance of this membrane, impairing vision, is frequently the first symptom that attracts attention; it loses its polish, and becomes nebulous in various degrees, from slight haziness to more developed opacity. The cloudiness is often partial in the com-

mencement, little nebulæ successively appearing, with portions of intervening transparency, which, however, soon participate in the obscuration. Not unfrequently lymph is effused in more considerable quantity, concealing the pupil, and involving the entire superficies of the cornea. The surface of the membrane, which is more or less rough, and bears some resemblance to ground glass, is observed, when closely inspected, to be covered with an infinite number of little dots or depressions, which exhibit, under a magnifier, the appearance of minute ulcers. The redness is not, in general, very considerable; a few purplish and turgid vessels may be seen running forward, and ramifying on the anterior part of the scleroticæ, whence they are sometimes continued in extreme subdivision over the cornea, the vascularity of which, however, is often scarcely perceptible. It is either generally diffused, or distributed in patches which are situated in the neighbourhood of the denser opacities; and not unfrequently assumes an imperfect zonular arrangement. In more strongly marked cases, a multitude of little vessels may be seen upon the circumference of the cornea, parallel to each other, and stretching with unequal attainment towards its centre; they are often exceedingly minute, of a brownish or dusky hue, and so numerous as to present, in some instances, an appearance of almost uniform vascularity. In the progress of the disease the iris may become inflamed, discoloured, and adherent to the crystalline capsule; or there may be a redundancy of the aqueous humour, from the extension of the morbid action to its secreting membrane, with prominence of the cornea, dilatation of the pupil, and impairment of vision in a greater degree than might be anticipated from the opacity,—occasionally, indeed,

bordering on amaurosis. There is usually little pain, or intolerance of light, but, as in strumous conjunctivitis, the latter is sometimes a very urgent symptom; and when this is the case; quickness of pulse, headache, restlessness, and other marks of debility, or constitutional disturbance, are also frequently present.

The disease chiefly attacks children, and young persons about the age of puberty, especially females of pallid hue and delicate constitution, who suffer most from the operation of depressing influences, and sustain with difficulty the changes which accompany the evolution of the generative system. At a later period, it is sometimes connected with suppression of the menstrual secretion, and not unfrequently originates without any very obvious cause. The eyes may be affected simultaneously, or in succession;—in the latter event, however, both organs are soon involved.

Treatment.—The treatment must be conducted on the general principles which have been already laid down, under the head of strumous conjunctivitis; atony or debility is the leading characteristic of the constitutional depravation in which the disease appears, and the improvement of the general health constitutes in this, as in other instances of defective or perverted action, a very important part of the *methodus medendi*.

To remove any existing gastric derangement, and relieve the torpor of the chylopoietic viscera, an emetic may often be advantageously premised, followed in the first instance by one or more active cathartics, of which calomel forms a constituent; and subsequently by more gently aperient medicines, as the *pilulæ rhei compositæ*, the tincture, or compound decoction of aloes, &c. The warm bath, or, where this cannot be procured, frictions

over the body with a coarse, wet napkin, will also be proper, together with such other measures as tend to restore and promote the cutaneous and digestive functions. The low degree of vascular action in the affected tissues rarely calls even for topical depletion, and in cases where the greater intensity of the symptoms demands its prescription, care should be taken not to carry it to a greater extent than may be necessary to avert the impending mischief. In the early stages, and sub-acute forms of the disease, the iodide of potass with the neutral mixture may be employed with the view of changing the action of the capillaries; or, if circumstances require a more energetic remedy, recourse may be had to the mild chloride of mercury, which frequently displays its wonted influence in arresting the progress of the inflammation, and promoting the absorption of the lymphatic deposition. It should, however, be prescribed only as an alterative, cautiously avoiding the production of ptyalism,—a result, except as indicative of its constitutional impression, seldom desirable in any of the ophthalmiæ,—and is particularly indicated when there is any threatened implication of the iris,—in which contingency, also, the application of belladonna to the brow should not be omitted. The compound calomel, or Plummer's pill, is an appropriate formula for its exhibition, but it may be administered in any mode, and often in conjunction with quinine and other tonics.

The circulation, though sometimes quickened by the general irritability, is usually indicative of debility, the process of sanguification is often imperfectly performed, and, in this enfeebled condition of the system, an invigorating treatment may frequently be instituted from the commencement. It is unnecessary to repeat here, what

has been said on this subject when speaking of the kindred affection already referred to. The sulphate of quinine and iodine, with the syrup of sarsaparilla as affording a convenient vehicle for the exhibition of either; the precipitated carbonate, and other preparations of iron; stimulating aperients, as the compound decoction of aloes, the tincture of aloes et myrrhæ, &c.; a plain, unirritating diet, and whatever has a tendency to correct derangement, and promote the due performance of functional action, may be severally employed with advantage, as the circumstances of each particular case shall require.

Counter-irritation, whether by blister or the tartrite of antimony, is frequently more injurious than salutary in its effects, and, though sometimes useful, is, in the routine of ordinary practice, too indiscriminately directed.

As a local application, the nitrate of silver is entitled to general preference, and in the strength of four grains to the ounce of water, should be dropped upon the eye every alternate day. At a later period, the vinum opii, or a solution of the sulphate of copper, may be advantageously substituted, with the view of stimulating the absorbents to the removal of the effused lymph.

A steady perseverance in the use of remedies is essential to the successful treatment of this protracted and often unmanageable affection. There is no occasion for confinement to the house, except in those cases where the iris is inflamed; exercise abroad is both cheering to the mind and conducive to the restoration of healthy action; and, in proper seasons of the year, the convalescence may frequently be accelerated and confirmed by a removal to the country, or to the sea-shore.

INFLAMMATION OF THE MEMBRANE OF THE AQUEOUS HUMOUR.

Inflammation of the internal lamina of the cornea, or of the membrane of the aqueous humour, is sometimes described as an independent disease under the title of aquo-capsulitis, or kerato-iritis. It possesses, however, many symptoms in common with strumous corneitis, the full developement of which it often accompanies, and, for all practical purposes, might have been included in that section. It is more particularly distinguished by a deeply-seated dulness or opalescence, interspersed with spots of denser opacity, which communicate to the cornea a variegated or mottled appearance; a turbid or cloudy state of the aqueous humour; and enlargement of the anterior chamber from redundancy of that secretion. The redness, as in the preceding affection, assumes the form of a zone, more or less distinct, around the front part of the sclerotica, the vessels from which, however, do not extend over the surface of the cornea; a sense of tension in the eye, pain above the brow, intolerance of light, lachrymation, &c., are present in various degrees; and lymph, or a lympho-purulent secretion, is sometimes effused in considerable quantity, and may be observed floating in the anterior chamber, or forming a thin layer upon the surface of the inflamed membrane. The morbid action involves also the other tissues, and in the progress of the complaint the iris becomes discoloured, thickened, and often partially adherent to the capsule of the lens. The disease is most prevalent among children of weak, lymphatic temperament; but is also seen, with more strongly diagnostic symptoms, in the adult.

The treatment, which differs in no very essential re-

spect from that prescribed for strumous corneitis, consists in local depletion to an extent proportionate to the severity of the symptoms, the alterative use of mercury, and the exhibition of the iodide of potash during the acute stage; and the sulphate of quinine, the hydriodate of iron with the syrup of sarsaparilla, chalybeates, the oil of turpentine, &c., &c., when the disease has assumed a chronic form. The warm bath, occasional aperients, &c., will also be serviceable; and, when the iris is inflamed, the dilatation of the pupil should be maintained through the medium of belladonna.

ONYX. UNGUIS. ABSCESS OF THE CORNEA.

Purulent infiltration between the laminæ of the cornea is a frequent consequence of the several ophthalmiæ, and when the effusion is situated at the inferior margin of the membrane is termed onyx or unguis, from its resemblance to the white appearance at the root of the nail. The most common seat of the abscess is the cellular membrane beneath the conjunctiva; and though frequently seen in the position just mentioned, it may appear on any part of the surface of the cornea, spreading with irregular outline, and surrounded by a light cloudiness from lymphatic deposition. The matter, which is thick and viscid, is generally absorbed after the vascular excitement has subsided, leaving more or less permanent opacity; but when this does not happen, it makes its way either externally, or into the anterior chamber, producing in the latter event, the phenomenon denominated spurious hypopion, and often leading to consequences injurious to vision.

Treatment.—The appropriate remedies for the removal of inflammatory action, are those which are also most effectual in limiting the extent and promoting the absorption of the purulent secretion. Venesection, purgatives, antimony, &c., will probably have been employed before the occurrence of the effusion; but, if otherwise, may still be necessary for the control of vascular excitement. The system should be brought under the alterative use of mercury with as little delay as possible, leeches applied to the temples, a blister to the back of the neck, and the antiphlogistic treatment generally, carried as far as is compatible with a due regard to the constitution of the patient. The pus, or lympho-purulent matter, is generally too tenacious to escape through an artificial opening, and the irritation caused by such operation could scarcely fail to aggravate the inflammation; if admissible under any circumstances, it is only so when the collection is large, accompanied with severe pain and hemicrania, and threatens to diffuse itself over the entire surface of the cornea. In making the puncture, care should be taken that the point of the instrument does not penetrate beyond the anterior wall of the abscess. When all inflammatory symptoms have disappeared, the process of absorption may be accelerated by various stimulating applications,—the solution of the nitrate of silver, the vinum opii, &c.

ULCER OF THE CORNEA.

Ulceration may affect merely the external covering, or implicate also the proper substance of the cornea, presenting two principal varieties, the deep and superfi-

cial;—the latter of which has already been considered when treating of diseases of the conjunctiva. It is a common result of inflammation, and according to Mr. Saunders, constituted nearly two-thirds of the cases treated at the London Eye Infirmary during his connexion with that institution. The texture of the cornea, which is somewhat analogous to that of cartilage, and the delicacy of its organization, render it extremely prone to the ulcerative process when its circulation is impaired from any cause, and hence it is, that in persons of advanced life, or feeble constitution, it sometimes occurs either without inflammation, or with very slight indication of increased vascular action. The ulcer assumes a variety of forms,—presenting, in some cases, a deep circular excavation, with smooth, glassy surface and rounded margin; and in others, a rougher and more superficial cavity, with irregular edges, generally preceded by effusion between the laminae of the cornea, and attended with symptoms of severe irritation: there is also the crescentic ulcer, situated near the circumference of the cornea, and almost peculiar to extreme senility. The two varieties last mentioned are generally associated with a disordered or enfeebled condition of the system, and the excessive irritability with which they are frequently accompanied, is partly owing to the action of the tears, and the constant friction of the palpebrae over their excoriated and sensitive surfaces. When the ulceration appears in connexion with strumous inflammation, intolerance of light and lachrymation are frequently present in a high degree.

Treatment.—Ulceration of the cornea occurring during the prevalence of acute inflammation, will generally cease as the vascular excitement subsides, and in the

subsequent cicatrization of the ulcer, little more is generally required on the part of the surgeon than to second the operations of nature, and avoid the interruption of the restorative process by the use of ill-timed and injudicious measures. The antiphlogistic system, already in operation, should be continued to an extent commensurate with the urgency of the symptoms, counter-irritation excited upon the arm or neck, and, if necessary, mercury in combination with opium exhibited at night, in order to change the perverted action of the capillaries. When notwithstanding the judicious employment of these means, the ulcer remains stationary, the eye irritable, injected, and subject to occasional attacks of pain, especially at night, or when the patient is in an horizontal position,—owing to the more ready congestion of the vessels in that situation,—a change of practice is plainly indicated. This state of things is generally dependent upon constitutional exhaustion, and the sulphate of quinine, with an improved diet, and exercise in the open air, will gradually restore the depressed energies of the system, and effect a corresponding change in the local affection. Topical stimuli also, constitute an important branch of the treatment, and may often be prescribed at an earlier period; of these the best is the nitrate of silver, and a solution of four grains may be dropped upon the eye once a day. If the friction of the palpebræ over the irregular surface of the ulcer occasions much irritation, thereby prolonging and aggravating the inflammation, a stronger solution must be used, and applied directly by a camel-hair pencil; or it may be necessary, in order to lessen the extreme sensibility of the part, to produce a slight eschar by touching it gently with a finely pointed pencil of the nitrate in substance.

The indiscriminate employment of this article in the form last mentioned, is, however, frequently productive of much injury, and some skill is required in determining the cases proper for its application;—as a general rule, the solution, varying in strength according to the indication to be fulfilled, will be found preferable. The same treatment is indicated when the ulcer assumes an indolent form, characterized by smoothness of surface, and the absence of inflammatory action, with little tendency to reparation;—this stationary condition, like that just mentioned, evidently arising from general debility: under these circumstances the ointment of the red precipitate (p. 59), is sometimes serviceable, and may be introduced at night beneath the palpebræ, and diffused by friction over the globe.

In strumous cases, and those also in which the ulceration is connected with a constitution otherwise depraved, mercury, if employed at all, should be very cautiously administered, and depletory measures, except in so far as they may be necessary to remove any active congestion that may be present in the incipient stage, are generally inadmissible. More benefit may be expected in these disordered conditions of the system, from the invigorating measures enumerated above; and these are still more imperiously demanded where there is a disposition in the part to degenerate into the sloughing process.

When the ulceration has penetrated the proper lamina of the cornea, its internal lining, or as it is frequently called, the membrane of the aqueous humour, sometimes protrudes in the shape of a small transparent vesicle, which has been termed *hernia corneæ*. It should be touched occasionally with a solution of ten grains of the nitrate of silver, the patient confined to a darkened

apartment in order to favour the dilatation of the pupil, and, when rupture is threatened, prolapsus of the iris prevented by the application of belladonna to the brow. The same precaution is also proper in protrusion of the iris through an opening near the centre of the cornea, but when the prolapsus takes place at its circumference, and involves only a small portion of that membrane, the dilatation of the pupil would probably increase the mischief it was designed to prevent. If the iris should protrude so as to become itself a source of irritation, its sensibility may be lessened, and its retraction promoted, by the nitrate of silver in substance or strong solution. It sometimes happens that, the ulcer not healing entirely, a fistulous orifice remains, through which the aqueous humour is discharged; and this also requires the same treatment.

Counter-irritation is often useful, and in obstinate cases of chronic ulceration, Mr. Lawrence has derived great benefit from the insertion of an issue in the temple.

Opacity in a greater or less degree, is a common sequel of ulceration involving the proper texture of the cornea, and, both in this, and more superficial abrasions, has sometimes been attributed to the decomposition of collyria of the acetate of lead; but the appearance supposed to be thus produced—a white adventitious layer or incrustation, very different from albugo or leucoma,—is also observed where none of the preparations of this metal have been used; and has been proved indeed, to be the result of a peculiar chronic ulcer of very intractable character, which occurs in middle life, and exhibits the same feature under all circumstances.

A minute depression, or excavation of the cornea, denominated *dimple*, sometimes remains after phlyctenula

or pustule, and is produced by the subsidence of the conjunctiva into the cavity made by the absorption of their contents. The defect is permanent, and when situated immediately opposite the pupil, may occasion some inconvenience by the reflection of the light from its smooth and uniform surface.

Gangrene of the cornea is not an unfrequent consequence of inflammation in strumous or impaired constitutions, and is a common occurrence in the severer grades of purulent ophthalmia; it is also sometimes caused by the direct application of escharotic substances. The lifeless portion is easily recognised by its opaque, shrivelled, and dirty-white, or yellowish appearance, not unlike that of a piece of thoroughly soaked leather; it frequently involves only the external lamina, and the imminent danger of the organ requires the prompt adoption of the appropriate remedies. If the vitality of the part has been destroyed by the action of caustic, or heated substances, the local abstraction of blood, and the antiphlogistic system generally, will be required to subdue the inflammation which follows so grave an injury; but in the other cases mentioned, depletion will have been already carried to an undue extent; and an opposite treatment—the sulphate of quinine conjointly with the compound tincture of cinchona, a generous diet, and a solution of the nitrate of silver, or the *vinum opii*—must be instituted.

OPACITY OF THE CORNEA.

Opacity of the cornea is a very frequent consequence of ophthalmia, and occurs in every intermediate degree,

from a slight haze or dulness, to entire loss of transparency. These several gradations are distinguished by different appellations, as nebula, macula, albugo, leucoma, &c. The first is a light diffused cloudiness, chiefly confined to the conjunctiva, and either partial or otherwise; when the opacity is distinctly circumscribed, small, circular, or linear, it is termed macula; albugo is produced by lymphatic deposition in the cellular tissue, or within the proper lamina of the cornea, and in its aggravated forms, involves the entire thickness of the membrane. Leucoma is the dense white opacity resulting from the cicatrization of wounds and ulcers, and is frequently complicated with anterior adhesion of the iris. An opaque circle sometimes appears on the circumference of the cornea in advanced life, and is known under the name of arcus senilis.

Treatment.—The primary indication is the removal of any existing inflammation by the local abstraction of blood, counter-irritation, and other appropriate measures. The opacity is sometimes caused by a diseased condition of the palpebral lining, incurvation of the tarsal margin, inverted cilia, &c., but the measures to be adopted for the cure of the disease when thus produced, have already been fully detailed.

These sources of irritation having been investigated, and, as far as practicable, removed, the cornea, in most cases of superficial opacity, tends spontaneously to recover its transparency; in infants and young persons particularly, where the membrane, owing to its looser texture, is more liable to become opaque from interstitial deposition, this is often accomplished in a much greater degree than might have been anticipated. When, however, the recuperative process is either stationary or

indolent, and the opacity—caused by lymphatic effusion, and not the result of a cicatrix—is capable of being either partially or wholly dispersed, a variety of stimulating applications may be employed with the intention of accelerating the action of the absorbents. Solutions of the nitrate of silver, the bichloride of mercury, and the sulphates of copper, zinc, cadmium, and alumine; the *vinum opii*, tincture of camphor, dilute acetic acid, and the liquor plumbi sub-acetatis; ointments of the red oxide, and nitrate of mercury, of iodine, creosote, and nitrate of silver; honey, molasses, the insufflation of powders containing red precipitate, calomel, &c., &c., have all been recommended for this purpose;—the more active articles being restricted to chronic cases of panniform opacity of the cornea or vascular thickening of its conjunctival lamina, and the denser forms of albugo.

Those applications which are in a fluid state, of which the best are the nitrate of silver, sulphate of copper, and the *vinum opii*, should be dropped upon the eye once a day, and the solutions, weak at first, gradually increased in strength according to the irritability of the organ. Much perseverance is required in their employment, and as the impression which they produce is diminished by repetition, it will be proper to vary them occasionally. Mr. Middlemore alternates for a period of one week each, the nitrate of silver, the bichloride of mercury, the *vinum opii*, and the reduced citrine ointment—the two former in the proportion of two or three grains to the ounce of water—and thinks that advantage is derived from thus using them in succession. The ointments may be applied directly to the part by means of a camel-hair pencil, or still more effectually, introduced beneath the lids, and diffused by gentle friction over the

globe. Baron Dupuytren appears to have relied chiefly on the insufflation of the red precipitate, or calomel, combined with sugar and the impure oxide of zinc.* The application is made twice in the twenty-four hours, and, according to that eminent practitioner, recent opacities are removed thereby, in two or three weeks, while those which are more deeply seated and extensive, involving nearly the whole cornea, and entirely preventing the transmission of light, may be dissipated in as many months. In the hands of the author, these formulæ, though not altogether without utility, have not proved as beneficial as might have been anticipated from the confident and exaggerated statements of the French surgeon. They are apt to occasion too much irritation, and will rarely admit of employment, even in chronic cases, more frequently than once in two or three days. A good plan for general adoption, is the alterative exhibition of mercury, counter-irritation by blister or the tartrate of antimony on the back of the neck or between the shoulders, and the use of a solution of the nitrate of silver, or of the sulphate of copper, the vinum opii, or the liquor plumbi sub-acetatis, according as circumstances may induce the preference of either of these applications. The liquor aluminis compositus, properly diluted, and combined with a small proportion of the vinum opii, is very much employed in the opacities of children and young persons, at the Royal Infirmary, Moorfields, London.

Leucoma being the result of the cicatrization of a

* R. Hydrarg. oxid. rub., gr. x; zinci oxid. imp., ppt., gr. xx.; sacch. alb., ʒij. Misc.

R. Hydrarg. chlorid. mit., zinci oxid., sacch. alb., aa, partes equales. Misc.

wound or ulcer involving the proper substance of the cornea, does not admit of removal; in albugo also, when the effused lymph has become organized, surgical treatment is of no avail, except perhaps in dispersing the more lightly diffused opacity which surrounds it; and it is unnecessary, therefore, to annoy the patient by persisting in the use of means which are inadequate to the accomplishment of the purpose intended. In such cases, if the opacity is partial, and situated near the centre of the cornea, vision may be much improved by the occasional application of belladonna.

That form of vascular albugo, in which the effused lymph has a loose granular appearance, is commonly observed in strumous, unhealthy children; and is most successfully treated by the internal exhibition of the sulphate of quinine in conjunction with local stimuli and astringents.

STAPHYLOMA OF THE CORNEA.

Staphyloma is a general term applied to a preternatural prominence on the globe, formed by the partial expansion of its membranes, and is restricted in its signification by the tissue principally affected. Staphyloma of the cornea occurs under two varieties,—the conoidal and spherical. The first is the most common, and is generally the consequence of an ulcer, pustule, abscess, or extensive interlamellar deposition. The projection may involve either a portion, or the whole of the membrane, and vision is impaired or lost, according to its extent, and the degree in which the pupil is implicated. There is always more or less disorganization of the transparent

tissues, and adhesion of the iris to the inner surface of the cornea is a necessary accompaniment of the disease. When the staphyloma is complete, the anterior chamber is entirely obliterated, and the cornea, opaque and often attenuated, projects in the form of a bluish or pearl-coloured tumour. The spherical variety is an occasional sequel of gonorrhœal, and the severer grades of purulent ophthalmia; but it may be produced by any cause which destroys the substance, loosens the texture, or impairs the vitality of the cornea. In such cases, the process of secretion continuing in usual or increased degree, while that of absorption is diminished, the aqueous humour accumulates in undue quantity, and the membrane yielding at every point of its circumference, the projection often attains a considerable magnitude. Having arrived at this stage, the staphyloma may either remain stationary, attended with loss of vision and deformity merely, or ulceration may take place at its most prominent part, followed by the escape of the aqueous humour, and temporary subsidence of the tumour. This termination, however, is more common in the conoidal, than in the spherical species.

Treatment.—When the staphyloma projects beyond the eyelids, the friction to which it is subjected, and the constant exposure of its apex to the action of external irritants, renders it liable to repeated attacks of inflammation, attended with sympathetic irritation of the healthy eye; and an operation may be required on this account, as well as for the removal of the inconvenience and deformity occasioned by the protuberant cornea. Repeated puncture with a grooved, or cataract needle, will diminish for a time the size of the tumour, and, in a few instances, this procedure has accomplished a radical

cure ; but for the attainment of this result, it is generally necessary to excise the more prominent portion of the cornea. Presuming the disease to involve the whole of that membrane, the surgeon transfixes the projection with the tenaculum, and, introducing a cataract knife through its centre, carries it onward so as to make a flap of the upper division, which is afterwards raised by the forceps, and the excision completed with the curved scissors ; or the operation may be performed still more expeditiously, by removing the requisite portion of the cornea with a single stroke of the knife from above downwards. If the membrane be not greatly deformed and protuberant, Demours, instead of excising the apex of the staphyloma, makes an incision in the cornea half a line or more from the sclerotica, and removes a portion of its border with the scissors. It is important to avoid any undue pressure upon the globe, in order to prevent, if possible, the escape of the lens and vitreous humour, and thus leave an adequate basis for an artificial eye ; this, however, cannot always be done, and the operation is sometimes followed by the entire evacuation of its contents. The excision having been completed, the lids should be closed, and covered with a fold of moistened linen, in order to prevent motion, and repress inflammation ; this, of course, always ensues in a greater or less degree, and if it should transcend the limits required for the reparative process, the usual remedies must be employed for its abatement. Hæmorrhage, also, sometimes occurs, and as the coagulum which occasionally forms, by separating the edges of the wound, might prevent reunion, it may be necessary to remove the projecting portion ; fungous granulations, when they arise, must be checked by the nitrate of silver ; and, if suppuration of

the globe should take place after the aperture has closed, the matter should be discharged by an early opening.

Partial staphyloma is produced by the protrusion of the iris through an opening made by ulceration of the cornea, and is necessarily attended with some diminution of the cavity of the anterior chamber. When the organic changes have not been so considerable as entirely to destroy vision, we may endeavour to induce adhesive inflammation, and thus arrest the further progress of the disease, by touching the apex of the tumour with a pencil of the nitrate of silver;—the evacuation of the aqueous humour by repeated puncture with any convenient instrument, may sometimes contribute to the success of this expedient. A seton in the back of the neck, a light diet, aperients, the solution of the nitrate of silver to lessen the irritability of the eye, and the avoidance, as far as practicable, of all causes of inflammation, will also be proper under these circumstances. If, notwithstanding these measures, the projection should attain such magnitude as to be productive of inconvenience, it must be removed in the manner already described. Where the patient has been so unfortunate as to lose the sight of the other eye also, every recommendation which promises relief will be eagerly embraced; the dilatation of the pupil by belladonna will much improve vision in some cases, and the formation of an artificial opening, when any considerable portion of the cornea retains its transparency, may perhaps be followed by its more permanent restoration.

When the iris protrudes through several ulcerations in the cornea, it presents an appearance not unlike that of a cluster of berries, and is hence called *staphyloma racemosum*;—a condition which does not admit of remedy.

CONICAL CORNEA.

In some cases the cornea, still retaining its transparency, gradually assumes a conical, or pyramidal form; and when viewed from certain positions, reflects the light so strongly, as to exhibit a peculiarly brilliant or sparkling appearance, which is characteristic of the disease. It generally affects both eyes, though not in equal degree; and is said to be most prevalent among females. It is sometimes congenital, and has been observed at all periods of life, but most commonly about the age of puberty. Demours, who treats of it under the title of transparent staphyloma, states that he and his father have met with more than a hundred cases of the kind; but in this country it would appear to be of rarer occurrence; this, however, may be owing to the fact of attention not having been particularly directed to the subject. The alteration takes place slowly, in many cases never proceeds far, and may require years for its full developement; when it either remains stationary,—the apex of the tumour becoming opaque from constant exposure to the action of external irritants,—or ulceration takes place, and is eventually followed by staphyloma.

The pathology of this disease does not appear to be well understood. It has been supposed to depend upon some aberration in the action of the nutrient vessels, in consequence of which the centre of the cornea becomes attenuated, and is unable to resist the pressure of the aqueous humour, now also redundant from increased secretion; but this, which is merely the expression in other words of the effect, furnishes no explanation of the cause of such morbid change. The patient is always

myopic, and the unnatural refraction renders vision confused and imperfect; the surface of the cornea is sometimes slightly irregular, and in such cases objects appear as if multiplied.

Treatment.—Little can be done to arrest the progress of this affection; but when it is attended with pain and tension of the eyeball, leeches should be applied to the temples, and their effects promoted by saline aperients and diuretics; it has also been proposed under such circumstances to evacuate the aqueous humour by puncture, but little or no benefit appears to have resulted from this measure. In the early stage of the complaint advantage may be derived from the use of a double concave lens, so arranged in a broad frame, as, by compelling the patient to look through a small aperture, to contract the sphere of vision; or spectacles may be made of a funnel shape, tapering to a small orifice. Mr. Travers prefers a piece of black wood, three or four lines in thickness, with an opening in the centre about the size of the pupil. The patient should abstain from all close exertion of the eye; and temporary advantage may be derived from the application of belladonna. The incipient opacity of the projection may in some instances be retarded or diminished, by the use of a solution of the nitrate of silver. Mr. Tyrrell has in several instances much improved vision, by puncturing the cornea, introducing a hook, drawing out and excising a portion of the iris, and thus removing the pupil from the centre to the circumference of the membrane. The prolapsus of the iris through a simple puncture immediately in front of the sclerotica, as practised by Himly in some cases of artificial pupil, would probably be sufficient to displace that aperture, without having recourse to the other steps of the operation.

DISEASES OF THE SCLEROTICA.

SCLEROTITIS.

Rheumatic Ophthalmia.

INFLAMMATION of the sclerotica is characterized by the peculiar appearance and distribution of the minute vessels, which exhibit a pale-red, pink, or light violet tint, and run in a straight direction to the margin of the cornea, around which they form a radiated wreath or zone, more or less distinct,—in some cases slightly encroaching upon its surface. It is further distinguished by tenderness of the globe and uneasiness on motion, the circumorbital pain, and the absence of any morbid secretion from the conjunctiva. The inflammation may ultimately involve the cornea, which becomes hazy or nebulous at its circumference, with the developement of red vessels in the opaque portion; or the pupil may be contracted and less active than usual, with discoloration of the iris, indicating the extension of morbid action to that structure. When this latter complication, unconnected with the former, exists in any considerable degree, the zonular arrangement is more strongly marked than in simple scleratitis, and the redness not extending entirely to the cornea, a white line may sometimes be seen immediately encircling that membrane. In a very protracted case now under treatment, the whole front part of the sclerotica is surrounded by a vascular wreath of nearly uniform breadth, which, in the occasional aggra-

variations of the disease, assumes a deep red colour; the cornea is obscured by lymphatic deposition in the inner moiety of its area; and numerous vessels, tortuous and straight, may be observed permeating the opaque portion,—the external division still preserving its transparency.

The pain, which, in sclerotitis, is increased by warmth, is dull, aching, pulsatory, or tensive, and is often less severe in the globe than in the surrounding parts; it is sometimes described as stinging or elancinating in its character, and is greatly aggravated at night, the patient being comparatively free from uneasiness during the day. The vascularity of the conjunctiva is usually very slightly increased, a few dilated vessels only being perceptible, and the superficial redness is never so considerable as to mask that of the sclerotica. The eye is hot and dry in the beginning, but this condition is soon succeeded by an augmented secretion of tears; and the intolerance of light, though not in general very considerable, is, in some cases, a prominent subject of complaint. Impairment of vision from obscuration of the cornea, is a common attendant upon the disease; and when it is violent and protracted, implicating also the internal tissues, the sight is sometimes seriously and permanently injured. The inflammation is often limited to one eye, and frequently alternates with rheumatic affections in other parts of the body, or makes its attack as they subside; and, in its severer forms, is accompanied with fever, gastric derangement, and other manifestations of constitutional suffering. It is tedious in its progress, less decidedly influenced by remedies than most of the other ophthalmiæ, extremely sensitive to atmospherical changes, and leaves behind an irritable

condition of the organ, which renders it liable to relapse from slight causes.

Sclerotitis, like other rheumatic affections, is most common about the middle period of life; and is generally occasioned by cold, or exposure to partial currents of air. Allusion has been made to its connexion with inflammation of the fibrous textures in other parts of the body, and it may be further stated, that it is sometimes seen in conjunction with gonorrhœa. Unattended with danger in itself, it may destroy vision by its complications, terminating in opacity of the cornea on the one hand; iritis, &c., on the other: and not unfrequently declining, with mitigated symptoms, into a chronic form which is exceedingly intractable.

Treatment.—When the pain and other symptoms are severe, and especially if any febrile excitement be present, venesection will be required; due regard being had in every case to the nature of the inflammation, the period of the disease, and the constitution of the patient. Local depletion also, by leeching or cupping, will always be proper; and may be repeated at intervals of three or four days, once and again, as circumstances shall indicate. Mercury exhibited with a view to its alterative action, is equally useful here, as in inflammation of the other fibrous tissues, and is especially demanded when the iris or cornea is implicated in the morbid action. It may be given with antimony and nitre by day, or in combination with opium at night, and discontinued as soon as its constitutional impression becomes apparent. For the more chronic stages of the complaint, the compound calomel pill, containing guaiacum and the sulphuret of antimony, furnishes an appropriate formula; under such circumstances, the bi-chloride is sometimes

preferred to the other preparations of mercury, and may be administered in conjunction with the syrup of sarsaparilla. An active cathartic of calomel and rhubarb should be prescribed in the commencement, followed by saline aperients; and regular peristaltic action insured by occasional laxatives during the continuance of the disease. Diuretics are often useful in inflammation of the fibrous membranes, both acting as derivatives, and supplying a mode of depletion which enables the surgeon to control vascular excitement without diminishing unduly the strength of his patient. The vinum colchici, with the nitrate of potash and the neutral mixture, may be directed with this intent, or the iodide of potass, and, in some cases, the tartrate of antimony, may be exhibited in the same combination. The warm bath, when it can conveniently be taken, is sometimes productive of good effects; mustard pediluvia at bed-time are also useful; and the compound powder of ipecacuanha, fulfilling the triple indication of determining to the surface, allaying pain, and procuring sleep, is an invaluable remedy. An opiate plaster to the temples, and frictions over the brow with laudanum, or with belladonna and mercurial ointment when there is any tendency to iritis, will often either prevent the accession, or moderate the severity of the nocturnal paroxysms; but more active rubefacients, by unduly exciting the nervous fibrillæ, and thus producing determination to the part, are frequently followed by an aggravation of the symptoms. Counter-irritation by blister, or the tartrate of antimony, should therefore be made at some distance from the seat of inflammation, as between the shoulders or on the arm; and since a metastasis of morbid action to the extremities, whether occurring spontaneously or induced by art.

would probably be attended by salutary consequences, it may, very properly, be encouraged by such means as are in the power of the surgeon. In chronic and debilitated cases, it is important to invigorate the system, and thereby render it less susceptible of atmospherical vicissitudes; the sulphate of quinine alone, or combined with myrrh and the exsiccated sulphate of iron, a nutritious diet, clothing in proper quantity and kind, exercise, and other similar measures, will often prove serviceable in the fulfilment of this indication. The tincture of guaiacum is also occasionally useful, or the *mistura guaiaci* may be prescribed with the iodide of potass and the wine of colchicum,* in the quantity of a table-spoonful morning and evening.

Mr. Mackenzie states that in old maltreated cases, the liquor arsenicalis, in the proportion of eight or twelve drops thrice a day, sometimes affords great relief; and under similar circumstances, Mr. Wardrop employs small portions of cinchona and the carbonate of soda,—five grains of each,—every three hours;—a prescription which Mr. Lawrence says that he has also used with the best effects.

Local applications are rarely productive of much advantage, but towards the close of the disease, when the eye is weak and irritable, and vascular congestion exists without any activity of symptoms, the *vinum opii*, or a solution of the nitrate of silver, may be dropped upon the eye once a day.

The iris should be maintained under the influence of belladonna throughout the progress of this ophthalmia;

R. *Mist. guaiaci*, ℥vj.; *vini colchici*, ℥j.-℥ij.; *potassæ iodatis*, ℥ij.-j.-iv.; *vin. opii*, ℥ss.-i.; *syrupi aurantii*, ℥j.; *olei menthæ pip.*, ℥v. *Misce.*—*Ryan.*

and after a cure has been accomplished, especial attention should be directed to the measures necessary to guard against relapse.

CATARRHO-RHEUMATIC OPHTHALMIA.

After what has been said of the separate affection of the several external tunics, it will be unnecessary to describe particularly the symptoms which mark their combination in the present instance; though as a complaint, frequent in its occurrence, and often destructive to vision, it is well deserving the attention of the practitioner. The usual indications of catarrhal conjunctivitis—a sensation as of sand in the eye, swelling of the lids, intolerance, lachrymation, increased mucous and meibomian secretion, pain, redness, &c.,—are present in a greater or less degree; and may occasionally proceed so far in developing the vascularity of the membrane and inducing chemosis, as to mask some of the symptoms peculiar to inflammation of the denser tunics,—both of which, the cornea and sclerotica, are generally involved in this disease. The latter, however, is sufficiently denoted by the character of the pain, which is subject to nocturnal exacerbations, and is situated chiefly in the eyebrow and temple. The cornea is extremely liable to suffer in this variety, from ulceration, abscess, or interstitial deposition. The ulcer is generally superficial, involving the conjunctival covering only, and cicatrizes without opacity, but often leaves behind a slight irregularity of surface. Purulent infiltration between the laminae of the cornea, which is also a very common occurrence, is a much more urgent symptom;—the matter tending to

either surface, and producing, when effused into the anterior chamber, the phenomenon denominated spurious hypopion. In other cases, the ulcer penetrates the whole thickness of the membrane; and prolapsus iridis, or staphyloma, is the result. The inflammation may also extend to the iris, terminating in effusion of lymph from its interior circle, and, in some instances, total obliteration of the pupil.

The disease is most common in those who have passed the middle period of life, and is occasioned by the ordinary causes of catarrhal ophthalmia, operating upon constitutions predisposed to rheumatic affections; especially by exposure to cold and atmospherical changes during the night.

The treatment does not differ from that prescribed for scleritis, except in the addition of the local remedies for catarrhal ophthalmia. It is, however, much more dangerous either than that disease, or than simple conjunctivitis, and should be treated, therefore, with corresponding activity. Bleeding, leeching or cupping, calomel and opium, purgatives, the tartrate of antimony, diaphoretics; mustard pediluvia, anodyne frictions over the brow, &c., &c., will all, or severally, suggest themselves for employment, as circumstances shall indicate. When the conjunctival symptoms are considerable, a solution of four or ten grains of the nitrate of silver may be dropped upon the eye once a day, followed by fomentations of warm water with laudanum and the acetate of lead, or of the bi-chloride of mercury in the proportion of one grain to eight or twelve ounces of water, and the application of the red precipitate ointment (p. 59) to the edges of the lids at night. Sleep should be procured by Dover's powder, or one of the preparations of morphia; and the

pupil maintained in a state of dilatation by the action of belladonna. When the antiphlogistic system has been carried sufficiently far, the *vinum colchici*, alone or combined with other diuretics, may often be prescribed with advantage; and in circumstances of local atony or general debility, occurring towards the close of the complaint, the sulphate of quinine and other tonics will display their customary good effects.

STAPHYLOMA OF THE SCLEROTICA.

The sclerotica is much less liable to become staphylomatous than the cornea, as well from its different organization, the strength and firmness of its texture, and its inaptitude to inflammation, as its exemption from interstitial deposition and ulceration, and its comparative security from accidental injury. When staphyloma does occur, it is usually the consequence of long-continued internal inflammation, especially of the choroid membrane; the vessels of which, enlarged and varicose from congestion, distend the globe, while the sclerotica, becoming attenuated by absorption, loses its resisting power, and projects in the form of one or more irregular bluish or lead-coloured tumours; accompanied with induration of the eyeball, immobility of the pupil, and great impairment, or total loss of vision, according to the extent of the morbid alterations. These partial enlargements may be situated either on the anterior or posterior hemisphere, but are most commonly observed on the superior and temporal portion of the eye; and sometimes, following the course of the *corpus ciliare*, they surround the cornea in a circle; constituting what has

been called staphyloma of the ciliary body. The varicose condition of the choroidal vessels continues after the disappearance of the inflammation, and the external prominences which they produce,—partly owing, in some instances, to serous effusion,—are therefore permanent. They often continue stationary, and rarely attain such magnitude as to require interference; but, if much deformity and sympathetic irritation be produced, their contents may be diminished by puncture; and, if this be inadequate to the accomplishment of the object, the humours may be discharged through an incision in the cornea.

Watery cysts and other tumours,—the former sometimes connected with the interior of the eye,—are occasionally observed growing upon the sclerotica; and, under the circumstances just mentioned, may be removed by the knife or scissors.

DISEASES OF THE CHOROID TUNIC.

FROM the loose texture and extreme vascularity of the choroid membrane, it would naturally be inferred that it was peculiarly predisposed to inflammation, and that this condition, when not highly aggravated, would be characterized by symptoms of congestion, rather than of much painful excitement; while its immediate proximity to the retina, and the necessity of its healthy state to the due performance of the functions of the eye, would further lead to the conclusion that the varicosity and other morbid changes thence resulting, would be manifested in amaurosis and various modes of defective vision. There is every reason to believe that what circumstances thus render probable, does in reality take place, though the situation and subsidiary office of this tunic, have prevented the same accurate diagnosis of its pathological deviations, which we are accustomed to form respecting the diseases of those tissues which are more directly subjected to our inspection.

CHOROIDITIS.

Inflammation of the choroid, owing to the considerations above alluded to, is recognised chiefly by its effects upon the neighbouring tissues; it is not indeed until the morbid changes which it induces become apparent through the opaque and dense sclerotica, that we are enabled to speak positively of its presence; and hence

it is, that though it has been long known as a complication of iritis and the internal ophthalmiæ, it is only of late years that pathologists have admitted its independent existence.

The early symptoms, which are often gradual and insidious in their progress, bear some resemblance to those of amaurosis; and impairment of vision is that which usually first attracts the attention of the patient. The various appearances described under the appellation of *muscæ volitantes* may exist for a while, but the imperfection soon assumes the form of a mist or smoke, and, slowly increasing, terminates eventually in obscuration more or less complete. The pain, which is tensive in its character, and principally seated in the eyeball, varies according to the extent and activity of the inflammation; it is generally moderate in the commencement, but when the distension is considerable, is often severe, affecting the surrounding parts, and accompanied with hemicrania, intolerance of light, &c. The sclerotica becoming attenuated by absorption, the dark colour of the choroid is perceptible through its texture, and the membrane, unable to resist the pressure from within, projects in the form of one or more bluish prominences; which have been described under the head of *staphyloma scleroticæ*, and constitute one of the most distinguishing characteristics of the complaint. This protrusion may be occasioned by a varicose condition of the choroidal vessels, or by effusion between the tunics, which operating also in a reverse direction, presses the retina towards the centre of the eye, where it may sometimes be seen through the pupil, displaying a white or glistening opacity. In some instances, the globe is so much enlarged as to be with difficulty covered by the palpebræ, while

in others, absorption of the vitreous humour having taken place, it exhibits the opposite states of softness and flaccidity. The iris is not necessarily involved in the inflammation, but it very often participates in the morbid action, changes its colour, and becomes adherent at its pupillary margin to the capsule of the lens. When it is not thus implicated, the pupil is sometimes displaced in the direction of the protruding portion of the choroid, retaining its dimensions or otherwise, according to circumstances. In one of two cases, in which the author was recently consulted, the iris is entirely unaffected, and the protrusions of the sclerotica, of which there are several, are unusually large; while in the other, the iris is discoloured, thickened, contracted, reverted, and adherent to the crystalline capsule. In the latter, a small bluish prominence exists in one eye only. The patient, a young man of feeble constitution and unhealthy appearance, had an attack of iritis two years before. Six weeks have elapsed since the occurrence of the present disease, which was severe in its incursion and rapid in its progress—vision in one eye being already quite destroyed.

The enlarged vessels of the sclerotica, ramifying over the prominences upon its surface, sometimes terminate in a radiated expansion near the cornea; and opacity of this membrane, in the form of an arcus senilis, is also an occasional symptom. The health of the patient is seriously impaired by the protracted suffering to which he is subjected, and a cachectic condition of system, with derangement of the digestive organs, and general debility, frequently accompanies the disease in its full developement.

According to Mr. Tyrrell, choroiditis, which as a

primary complaint is not of common occurrence either in its acute or chronic form, is more frequent in females than in males, generally affects persons of lymphatic temperament, with fair complexion and blue irides, is sometimes seen in infancy, and is rarely observed after the middle period of life. Mr. Mackenzie, on the contrary, who appears to have been the first to direct attention to this subject, states that he has never met with it in children, and with this gentleman the experience of the author hitherto coincides. Convalescence is very gradual, and though the progress of the disease may be arrested, its effects, especially when it has gone so far as to produce protrusion of the sclerotica, are usually permanent.

The attenuation, livid discoloration, and projection of the sclerotica, the peculiar irregularity of the pupil, the early impairment of vision, and the absence of the symptoms diagnostic of those affections, sufficiently distinguish simple choroiditis from inflammation of the iris, retinitis, or glaucoma. It frequently happens, however, particularly in its latter stages, that general internal ophthalmia supervenes, and the affections of the several tissues are so blended together that it is quite impossible to unravel them, and often difficult to determine the order of their invasion.

Treatment.—General and local depletion, purgatives, diuretics, mercury, counter-irritation, &c., judiciously adapted to the period of the complaint, the character of the symptoms, the age and constitution of the patient, are the appropriate remedies in this, as in the other varieties of internal ophthalmia. The extreme vascularity of the choroid, however, occasions some difference in their operation,—inflammation of that tissue in

its early stage, being more decidedly influenced by the abstraction of blood, and less evidently under the control of mercury; a remedy which is nevertheless of essential service in its complication with iritis. The vessels, moreover, sooner lapse into a debilitated condition, and after the due employment of depletory measures, tonic medicines may be earlier administered than in inflammation of some other tissues. In protracted and enfeebled cases also, an alterative and invigorating treatment is required; and quinine, chalybeates, the tincture or other preparations of iodine with syrup of sarsaparilla, a nutritious diet, exercise, and whatever tends to improve the general health, may be employed concurrently with a gentle mercurial course. Mr. Mackenzie has exhibited the arseniate of potash, in the thirtieth part of a grain, three times a day, with considerable benefit in the advanced stage;—the morbid appearances subsiding under its use, and health and vision simultaneously improving. When the globe is very tense and painful, with an evident propensity to staphylomatous projection, temporary relief may be obtained by puncturing the sclerotica and choroid, with a cataract or grooved needle, and the operation may be repeated at intervals of eight or ten days. In one instance Dr. Maitland performed this little operation of paracentesis oculi, thirty-three times, and with eventual success as regards the relief of pain and the diminution of the projection.

MUSCÆ VOLITANTES. MYODESOPIA.

The appearance of minute objects floating before the eyes, will hereafter be noticed as a common symptom in

the incipient stage of amaurosis; it occurs also as an idiopathic affection, in which form it is sometimes congenital; and may be either temporary, or continue through life, without seriously impairing vision. If there is only a single black spot, it is termed scotoma; but when they are more numerous, they have received the fanciful appellation of *muscæ volitantes*. These imaginary objects, familiarly called motes, are more or less distinct in different cases, and assume a variety of forms, sizes, and shades; consisting, not unfrequently, of a number of semi-transparent tubules or lines, variously contorted, and interrupted at intervals by small, circular, and darker-coloured convolutions, which are also detached, and scattered irregularly over the field of vision. In other instances they have a reticulated appearance, and are sometimes described as an indistinct collection of hairs, or as bearing a distant resemblance to the shape of an insect. They follow the motions of the globe, moving perpendicularly or horizontally, as it is turned upwards and downwards, or to either side; are most perceptible in a strong light, or when the eye reposes on a white ground, as paper, a wall, or light cloud; may affect either one or both eyes; and frequently occasion much uneasiness from the dread of impending cataract or amaurosis. They are seldom seen immediately in the optic axis, and are of more difficult examination in proportion to their distance from it,—continually eluding the gaze of the beholder, and fatiguing the eye in its ineffectual attempts to fix them, and unravel their intricacies.

The pathology of this complaint is still open to investigation. Various explanations have been given, no one of which is entirely satisfactory. The most probable,

perhaps, is that which regards as its proximate cause, a partial enlargement or varicosity of the vessels of the choroid, induced by a plethoric condition of the system, undue exertion of the visual organs, and whatever else may occasion determination to the head, or modify the circulation of that membrane. In many cases, it is evidently symptomatic of derangement of the stomach and collatitious viscera, and is increased by any temporary aggravation, as when the patient is suffering under an attack of cephalæa nauseosa, or sick headache. Mr. Mackenzie, one of the most judicious and philosophical writers on the diseases of the eye, is of opinion that the transparent muscæ of tubular form, are owing to the dilatation of those branches of the arteria centralis retinæ which ramify upon the surface of that nervous expansion; and that those of darker hue are produced by the insensibility to light of certain parts of the membrane, arising either from the pressure of some irregularly projecting points of the choroid, or from some other cause.

So long as muscæ volitantes are unattended with pain and the other symptoms enumerated under the head of amaurosis, the pupil preserves its clear black colour, the iris its accustomed mobility, and the individual retains unimpaired the power of distinguishing minute objects, he may be assured that his forebodings of approaching evil are entirely groundless. They sometimes depend upon causes of temporary operation, and disappear with their removal; in other cases, as already intimated, they continue for many years, and not unfrequently through life, without impairing vision, or occasioning serious annoyance, when, apprehensions of danger being no

longer entertained, the attention ceases to be directed particularly to them.

The author having lately been informed by Dr. Samuel Jackson of Northumberland, now of this city, that during the dilatation of the pupils by belladonna—applied on two different occasions, with the view of testing the quality of that article—the muscæ with which he was annoyed, nearly or quite disappeared; was induced to try the experiment upon his own eyes, similarly affected, and the result was a confirmation of the statement which he had received. It is hardly probable that the muscæ which are the harbingers of amaurosis, would be so much benefited by the increased quantity of light thrown into the eye; and an addition is thus made to our means of diagnosis, the more valuable, that it will enable the surgeon, with greater appearance of certainty, to dispel the fears of his patient.

Treatment.—When the disease is recent, and depends upon an actively congested state of the choroidal vessels, occasioned by general plethora or local determination, and especially if it be preceded or accompanied by photopsia, mild antiphlogistic measures,—topical depletion, saline laxatives, abstinence, &c., and the avoidance of all the exciting causes, constitute the appropriate treatment. If, however, as is most commonly the case, it occurs in connexion with nervous irritability and exhaustion, an atonic state of the system, or is symptomatic of functional derangement of the abdominal viscera, the cure must be attempted by means adapted to the removal of these several conditions. A light unirritating diet, regular exercise, gentle aperients of calomel and rhubarb, valerian and chamomile with the com-

pound tincture of cinchona, quinine, chalybeates, the preparations of iodine with the syrup of sarsaparilla, the compound decoction of aloes, change of scene, &c., &c., with the cheering assurance of security from danger, may be advantageously employed in the circumstances last mentioned.

It is not always easy to distinguish the cases which arise from active congestion, from those which depend upon debility, but except in the early stages of the complaint, this is not a matter of much practical importance, since an atonic condition of the capillaries is in both the ultimate result; and an alterative and invigorating treatment is therefore often required, even when the appearance of the patient might seem to contra-indicate its employment. Mr. Houston relates the following case, communicated by Dr. Ryan, in illustration of the difficulty which frequently occurs in discriminating the sthenic from the asthenic varieties of this disease.

“A gentleman of about forty years of age, of dark complexion, lymphatic temperament, full habit of body, and active in his pursuits, suffered from permanent *muscæ volitantes* for two years.

“He consulted the following gentlemen in the order in which their names appear:—Mr. Guthrie, Mr. Lawrence, Mr. Tyrrell, Mr. Alexander, Dr. Chambers, and Dr. Ryan. The majority considered his case sthenic, the minority asthenic. He gave the fullest trial to antiphlogistic measures, which only aggravated his disorder; and he was completely cured by the use of tonics, and the improvement of the general health.”

If the defect has already existed many years, the spots do not increase, and the individual continues to enjoy perfect vision, no treatment of any kind is required.

DISEASES OF THE RETINA.

THE retina, in common with other organs, is not only liable to organic and functional derangements, but more than usual difficulty occurs in their investigation from its concealed situation, the deficiency of pathological data respecting its structural lesions, and the variety and obscurity of its merely nervous or functional aberrations. The influence of the ophthalmic division of the fifth nerve, to which attention was first drawn by Magendie in his startling interrogatory,—“*La vue peut-elle etre conservee malgré la destruction des nerves optiques?*” and which by filaments distributed to the retina has since been proved to be the source of common sensibility to light, as distinguished from the faculty of vision, and also, the regulator of the pupil through the medium of the lenticular ganglion, has furnished an explanation of several points of abstruse physiology; and among the many things that still remain to be elucidated, further observation will probably demonstrate that this nerve is likewise frequently operative in the production of functional or sympathetic amaurosis, and various transient abnormal states of vision.

RETINITIS.

Dimness of sight, rapidly advancing in some cases to its complete extinguishment, without corresponding affection of the transparent tissues, is one of the earliest and

most prominent symptoms of this inflammation. It is further accompanied with intolerance of light, scintillations or ocular spectra, *muscæ volitantes* or dark clouds floating before the eyes, fulness and tenderness of the globe, headache, and pain of various degrees of intensity, in and around the orbit. The pupil is slightly contracted, irregular, and sluggish in its motion, and, though not a necessary attendant, there is often a faint zonular vascularity on the anterior part of the sclerotica, with occasional slight discoloration of the iris, and even partial adhesion of its inner circle to the capsule of the lens. In the more chronic cases, where the symptoms of hyperæmia or congestion predominate over those of inflammation, the photophobia is scarcely perceptible; and the pupil, dilated and immovable, exhibits, instead of its clear black colour, a turbid or greenish hue. The pain in the commencement, may be remittent or intermittent; it is often severe; but though generally present, is not so invariable in its attendance as the illusory appearances just mentioned. These exist in endless variety in different individuals, from a few small sparks to the most brilliant flashings or coruscations; and often continue for years after vision is entirely lost, deceiving the unhappy patient into the belief of its eventual restoration. Other indications of functional disorder of the retina, are also occasionally observed,—objects appearing confused, disfigured, or only partially visible. The digestive organs are more or less deranged; there is generally considerable febrile disturbance; and the headache in particular, is often a principal subject of complaint.

The inflammation in this comparatively mild and subacute form, probably affects only a portion of the retina; being confined, according to Rosas, to the neighbourhood

of the macula lutea ; but there is another and more active modification, less frequent in its occurrence, which, originating perhaps in its serous lamina, involves the whole expanse of the membrane, and implicates also, in much greater degree, the other tissues of the eye ; producing extensive, disorganization, and terminating not unfrequently in complete ophthalmitis. It either makes its attack suddenly, or is preceded, for a brief period, by an uneasy or tensive sensation in the globe. The pain is deeply seated, throbbing, and agonizing, sometimes paroxysmal, extending to the head, increased by the slightest motion of the organ, and attended with giddiness,—occasionally even with delirium. The intolerance of light is excessive, the lachrymation profuse, and vision, seriously impaired from the commencement, is soon entirely destroyed ;—total blindness sometimes supervening in a few hours. The pupil is greatly contracted in the first instance, in many cases, indeed, almost to obliteration, but again dilates as the sensibility of the retina is destroyed ; it occasionally exhibits a greenish opacity, and the iris—changed in colour, and otherwise altered from its normal condition—is pressed towards the cornea by the turgescence of the posterior tissues, encroaching upon, and diminishing the cavity of the anterior chamber. The external tunics participate in the inflammation, the cornea loses its transparency, the sclerotica and conjunctiva become injected,—often highly vascular,—and the symptoms, having attained their acme of aggravation, terminate at length in suppuration. The purulent deposition first appears at the lower part of the anterior chamber, but, accumulating in greater quantity, it may fill the cavity and protrude the cornea ; which, being weakened in its texture, yields to the distending power,

and the matter is discharged with evident mitigation of suffering.

Retinitis sometimes occurs without any very obvious cause, but, in most instances, can be directly traced to exposure to intense light and heat, either separately or combined; mechanical injuries, as the operation for the depression of cataract; prolonged exertion of the eye in viewing minute and brilliant objects, &c., &c. It is hence of frequent occurrence in countries where the ground is constantly covered with snow, and has also been produced by imprudently gazing upon the sun during an eclipse. In its sub-acute and chronic forms it is a common cause of amaurosis in cooks, watch-makers, jewellers, &c.; and in a case which recently came under the care of the author, was excited by the too diligent use of the microscope during a summer's day ramble,—the injurious effects of the instrument being doubtless favoured by the circumstances under which it was employed.

Treatment.—Though extremely dangerous, retinitis is not always destructive to vision, if the appropriate remedies are timely and judiciously employed. Venesection, leeching, purgatives, and mercury, comprise the *material* of practice, and should be prescribed with a promptitude and freedom proportioned to the period of the complaint, the severity of the symptoms, and the age and constitution of the patient. In ordinary cases, one general bleeding will usually suffice, and the subsequent steps of the cure may be safely entrusted to the other remedies mentioned. Mercury is an invaluable resource in this form of ophthalmia, displaying a degree of sanatory power fully equal to its acknowledged efficacy in iritis; and should be exhibited in such manner, as, with-

out exciting any considerable degree of salivation, to produce its constitutional impression with the least possible delay. The termination, which is chiefly to be apprehended, is interstitial deposition in the texture of the retina, and even when this has occurred, its alterative action, induced before the effused lymph has become organized, and therefore incapable of removal, has often succeeded in effecting its absorption and restoring vision. The iodate of potash, and the oil of turpentine, have been recommended as substitutes, in debilitated and depraved conditions of the system, and, though of inferior efficacy, may be sometimes usefully prescribed under such circumstances.

In the management of the more vehement grades of this inflammation, the surgeon should bear in mind the suddenness of its onset, and the rapidity of its progress; irreparable mischief is sometimes produced in a few hours; and although the extent of the depletion must be regulated by the considerations above stated, the importance of the affected organ requires that it should be carried as far as can be done consistently with a due regard to the safety of the patient. Counter-irritation on the back of the neck, or between the shoulders, may be usefully directed in some cases; the light, when painful, must be carefully excluded; and every part of the antiphlogistic regimen—diet, repose, &c.,—rigidly enforced.

CHRONIC RETINITIS. AMAUROSIS.

Acute and sub-acute retinitis, whether owing to the vehemence of the attack, neglect, or inefficient treat-

ment, are extremely liable to terminate in loss of sight; but there is a chronic inflammation, more frequent in its occurrence, which may be equally destructive to vision, and as it is, perhaps, the most common cause of amaurosis, may be properly included in the description of that disease.

When amaurosis occurs as a consequence of chronic inflammation of the retina, the usual indications of vascular excitement are present, though in a much slighter degree than in the preceding form; the patient complains of pain or uneasiness in the eye, accompanied with a sense of heat, dryness, and a morbid sensibility to the impression of light, which, however, may not amount to actual intolerance. He evinces an aversion to use the organ, and is also annoyed by *muscæ volitantes* and ocular spectra of different kinds. The sensibility of the membrane is gradually lessened by interstitial deposition, and vision is impaired in every intermediate grade, from slight dimness to total loss of sight; objects at first appear obscure, as if enveloped in mist or smoke, are confusedly blended together, and, in some instances, are only partially discerned; while, in others, their shape is variously distorted, or there is an erroneous perception of colour. *Strabismus* and double vision are frequent symptoms, and it not unfrequently happens, that when the central portion of the retina has become quite insensible, the patient is still capable of seeing objects situated laterally with tolerable distinctness. The imaginary bodies which obstruct the sight assume a variety of forms; exhibiting an appearance as of a network, gauze, or cloud, a single black spot in the axis of vision, dark motes, and not unfrequently flashes of light, sparks, and other luminous figures. They are generally fixed

and permanent, aggravated by whatever increases the determination to the head, and are an unfavourable symptom, inasmuch as they usually indicate alteration in the nervous tissue, or serous laminæ of the retina. The pain, likewise, differs in degree, nature, and situation; it is often accompanied with giddiness, and is frequently a prominent subject of complaint, though, in many cases, it is rather an uneasy sensation of fulness and distension than a feeling of positive suffering. It may be either constant or otherwise, assumes sometimes the form of general headache or hemicrania, and is frequently confined to the brow or neighbouring parts. The pupil is usually dilated and immovable, or, if the iris still preserve any degree of action, its motions are sluggish and limited in extent; instances, however, of regular contraction and dilatation are not very uncommon. If one eye only is amaurotic, the pupil may often be observed to dilate when the other is closed, and vice versa,—its associated action continuing after its independent motion is destroyed; it is very frequently irregular, sometimes displaced, and instead of its natural pure-black colour, often exhibits a dull, turbid, or horny appearance. In many instances where the amaurosis is complete and inveterate, the countenance loses its expression, and acquires a vacant, unmeaning stare, which is never seen in cataract, and, to an experienced observer, at once betrays the nature of the malady;—under such circumstances, also, the globe frequently has a tremulous, vacillating, or rolling motion. The preceding description applies more particularly to the disease as produced by chronic inflammation of the retina; but it may also originate, with some modification of symptoms, in the brain or optic nerve, in nervous exhaustion or gene-

ral debility ; or sympathetically, from various disordered conditions of the abdominal viscera. Cerebral amaurosis may be suspected from the presence of severe and unmitigable pain, vertigo, photopsia, imaginary sensations about the eyes and cheeks, and paralysis of other parts ; as loss of feeling or power over some of the proper muscles of the organ or of the face, inducing lagophthalmus, ptosis, distortion of the mouth, &c. When the disease occurs in connexion with a debilitated state of the system, or is sympathetic of irritation in other parts of the body, the pain and other indications of increased action are much less apparent ; and in the former case, there is from the beginning a diminished sensibility to light,—the patient requiring a brilliant illumination of objects for the purposes of vision.

The progress of amaurosis is extremely various ; the disease may be produced suddenly, or, as more frequently happens, may require months and even years for its full developement. It is most common in the middle and later stages of life ; usually commences in one eye, and often does not attack the other until vision in that first affected is either much impaired or totally destroyed ; and may be either partial or complete, temporary, permanent, or periodical : it is sometimes congenital, and not unfrequently hereditary. The author was recently consulted in a case, in which four of five children in one family were born blind, the parents themselves enjoying perfect vision ; and Demours relates an instance of a father and four daughters who had each very imperfect sight with the right eye.

The causes of this affliction are very numerous, and include, as direct or predisposing, whatever has a ten-

dency to excite inflammation, congestion, or disordered circulation in the nervous apparatus of vision ;—undue and constant employment of the organ on minute or shining objects, exposure to intense light or heat, as fires, forges, glass-houses, &c., gazing too intently on the sun during an eclipse, travelling in regions covered with snow, the prolonged use of microscopes, &c. ; external injury from wounds, blows, and the irritation of a depressed lens ; febrile diseases, violent passion, insolation, intoxication, tight lacing, plethora induced by excessive repletion, sedentary habits, the suppression of habitual evacuations, and determination to the head from any cause ; pressure upon the brain or optic nerve, and various other pathological conditions of these parts ; different forms of gastric or intestinal disorder, worms, constipation, or the presence in the stomach of some irritating substance ; certain states of the uterine system, particularly pregnancy, hysteria, and amenorrhœa ; nervous exhaustion, produced by venereal excesses, onanism, &c. ; general debility from loss of blood, diarrhœa, lactation, menorrhagia, leucorrhœa, &c. ; the depressing emotions ; gout, rheumatism, syphilis ; extreme senility ; irritation occasioned by the growth and decay of the teeth, inverted cilia, and tumours on the palpebræ ; injuries of the supra and infra orbital nerves, &c., &c. Many of the causes just enumerated, operate through the medium of the trigemini, and experience and observation prove that amaurosis and other affections of the eye, are more frequently connected with functional derangement of that nerve than is generally imagined,—the irritation thus produced sometimes manifesting itself in exaltation of action, as in the photophobia of strumous and hys-

terical individuals, and at others, by insensibility to the impression of light, and impaired or confused vision from mydriasis or excessive dilatation of the pupil.

A curious case, instructive in several respects, recently occurred at the Wills Hospital. A patient was admitted with rheumatic ophthalmia of the right eye, who, twenty years before, had lost the sight of the left, from a wound inflicted by a particle of metal. The ciliary nerves had been injured by the accident, and the pupil, approaching to an oval form, had deviated from the centre to the circumference of the iris. Previously to his admission, he was barely able with this eye to distinguish light from darkness, but during the inflammation of the other, its vision gradually improved, and was entirely restored by a metastasis of the ophthalmia, which occurred without any obvious cause. When discharged from the house, he was able to see equally well with both eyes.

The proximate cause of amaurosis is inability of the retina, the optic nerve, or the portion of the brain from which it originates, to perform their appropriate offices; but on what this defect more immediately depends, is not always apparent: the organization of the retina being so delicate, that abnormal deviations which are sufficient to destroy its functions, often produce no appreciable alteration of structure. In some cases traces of inflammatory action are perceptible, and in others, the nerve has been found atrophied, and subjected to pressure from tumours developed in its substance, in the cellular tissue of the orbit, the bones of the cranium, the dura-mater, or brain; but the autopsy frequently fails to reveal any cognizable organic change.

Amaurosis is liable to be confounded with cataract

in its incipient stage, and also with glaucoma,—a mistake the more likely to happen, inasmuch as it sometimes supervenes on the internal inflammation which gives rise to the green discoloration of the pupil characteristic of the latter affection, and these several diseases, moreover, frequently exist in various degrees of combination. In addition to the judgment to be formed from an intelligent consideration of the symptoms appertaining to each complaint, modern science has furnished an infallible means of establishing the diagnosis, by a beautiful application of the laws of optics to the investigation of the defects of the instrument which may be said to have dictated them. The crystalline and its envelope being perfectly transparent in uncomplicated amaurosis, the three images of the candle, reflected in the order of their appearance from the cornea, the posterior, and the anterior hemisphere of the capsule, are always plainly visible; while in cataract, only the small upright or anterior image, reflected from the cornea, is present in all its perfection; the two others being either indistinct or altogether absent, according to the degree of the opacity.

If the amaurosis have originated in inflammation which has long subsided, it probably depends on some structural alteration of the retina, and is not likely to be removed by any measures which may be adopted; equally discouraging is the prospect when it is symptomatic of some disorganizing process in the brain or optic nerve: the prognosis is more favourable when it arises from recent chronic retinitis, sympathy with irritation in other parts of the body, congestion, general debility, and the other causes mentioned above. In its incipient stage, and when, though complete, the disease is of late occur-

rence, we may sometimes succeed in arresting its progress and restoring vision ; but if confirmed, or complicated with other affections, it may generally be regarded as incurable ; and under such circumstances, it is worse than useless to harass the patient, and perhaps impair the vigour of his constitution, by perseverance in the employment of means which can lead to no beneficial result.

The treatment of a disease, or more properly a symptom—for the loss of sight is merely indicative of some precedent lesion—depending upon so many and such opposite conditions, must of course vary exceedingly in different cases. A strict inquiry should, in every instance, be instituted into the origin of the complaint, which may be either inflammatory, congestive, nervous, or sympathetic, and the practice regulated accordingly ; otherwise the surgeon will be guided by no rational aim, and his prescriptions must necessarily be tentative and empirical. If the patient be robust and plethoric, and symptoms of cerebral congestion be present, or if there be any indication of vascular excitement in the retina, venesection will be required, and may be followed by the application of leeches to the temples, or by cupping from the back of the neck. Active cathartics, counter-irritation between the shoulders, a restricted diet, and the general observance of the antiphlogistic regimen, will also be proper under such circumstances. Mercury often evinces a striking control over disease of the retina, and should be promptly exhibited in every instance, with a view to its alterative effect ; while, if the symptoms continue unabated, and no contra-indication exist, the patient should be brought more decidedly

under its influence, and its constitutional impression maintained for a considerable length of time.

A similar practice, duly regulated by the constitution of the patient, is also indicated in the more simply congestive or hyperæmial forms of the disease, which appear to involve the retinal circulation alone, unaccompanied by any marks of increased action in the sensorium. Mustard pediluvia may be appositely employed in these cases, in conjunction with such of the preceding remedies as occasion shall demand; and diuretic medicines, which both act as derivatives, and furnish a mode of depletion less debilitating than some others, may also be usefully prescribed.

Congestion in a greater or less degree, may possibly be present likewise, in some of those cases which are connected with a debilitated, exhausted, or anæmic condition of the system; for the retina being in a state of constant, and often undue excitement, becomes a centre of irritation towards which the blood flows, and accumulates in its atonic vessels. But under such circumstances, depletion, by increasing the general feebleness without relieving the local plethora, would only aggravate the mischief. There is here a want of innervation from defective sensorial energy, and a course of treatment is required which will invigorate the system, and thus restore the tonicity of the capillaries. Tonics, alteratives, stimulating aperients, a nourishing diet, repose of the organ, exercise, country air, the shower-bath, sea-bathing, wine, porter, &c., are the modes of accomplishing these indications; and quinine with myrrh and the dried sulphate of iron, the tincture of cinchona with any light bitter infusion, the *mistura ferri*

composita, the carbonate of iron, the preparations of iodine with the syrup of sarsaparilla as an agreeable vehicle, the compound decoction of aloes, &c., &c., are some of the agencies by which they are more immediately fulfilled. If a mercurial alterative be deemed necessary, the pilula hydrargyri with quinine, may be given during the day, or calomel exhibited in the form of Plummer's pill, or in combination with opium, at night.

In these cases, moreover, gentle stimuli to the eye, nares, and neighbouring parts, are sometimes useful in awakening the torpid sensibility of the retina; and the vapour of ether and ammonia, galvanism, sternutatories, ammoniacal frictions, and counter-irritation by sinapisms and other rubefacients, which, while they act as revulsives, do not, by producing discharge, augment the existing debility, may be advantageously employed for that purpose. When the amaurosis has arisen from sympathy with irritation in other parts of the body, the cause should be carefully investigated, and, if possible, removed; particular attention should be given to the correction of any existing visceral derangement, and the remedies prescribed with this view,—mercurial aperients, the preparations of iodine, vermifuges, emmenagogues, &c.,—perseveringly employed. Suppressed evacuations should be restored, morbid profluvia arrested, and every source of nervous exhaustion carefully avoided.

In those forms of the disease which are dependent upon organic changes in the brain or optic nerve, there is, of course, little hope of restoring vision; but the remedies which tend to the accomplishment of this

object, are also those which are most effectual in mitigating the cerebral symptoms.

Strychnia promised at one time to prove a useful addition to our therapeutical agents in some forms of amaurosis, and the profession is still divided in opinion respecting its real value. Benefit has, in a few instances, followed its employment by the author, but it was used conjointly with other remedies, and the improvement was attributed as much to them, and the irritation caused by repeated vesication, as to the article in question. Messrs. Lawrence and Tyrrell speak in decided terms of its inefficacy, while by Middlemore and Ryan it is regarded with greater favour. It is employed in the endermic method: the cuticle having been removed from a space above the brow, or before the ear, by the previous application of a blister, one-fourth of a grain is sprinkled on the abraded surface. The quantity is gradually increased to one or two grains, or until the peculiar effects of the medicine are perceived; and if it occasion much pain or irritation, it may be combined with opium, or diluted with flour, gum arabic, or any simple substance. The gentleman last mentioned, prescribes it also in the form of ointment* and solution,† alternately rubbed around the brow and dropped upon the eye; and occasionally also, administers it internally.‡ In this last mode especially, great caution is required to

* *R. Strychniæ, gr. 1-6, j.; ung. cetacei, 3j. Misce.*

Veratria in the proportion of ten or twenty grains to the ounce of lard, may be applied in the same way as the ointment of strychnia, and is sometimes useful as a counter-irritant.

† *R. Strychniæ, gr. i.-ij.; acidi acetici, dil., 3j.; aquæ destillatæ, 3j. Misce. Hujus instillentur, ℞iij. inter palpebras, semel vel bis in die.*

‡ *R. Pulv. strychniæ crystallizatæ, gr. j.; pil. rhei compos., 3j.; ol. menthæ pip., ℞iij. Tere intime et in pilulas xij. divide, quarum capiat j. m. n.*

guard against the injurious effects which strychnia sometimes produces; and as it is a powerful stimulus to the nervous system, it should never be directed during the continuance of inflammation, or any active congestion.

Dr. Pritchard recommends an incision through the scalp down to the pericranium, along the whole length of the sagittal suture, and the conversion of the wound thus made, into an issue. He states that such treatment has been most successful where mercury and the antiphlogistic regimen had failed. By Dr. Beardsley also, this mode of counter-irritation was advantageously tried, after the failure of other remedies, in two cases of severe cerebral disease, accompanied, besides the amaurotic affection, with great mental imbecility and stupor. Few surgeons, however, would be found to recommend, and still fewer patients to submit to so violent a remedy, where the prospect of benefit is so uncertain.

When the amaurosis has been produced by lesion of the supra-orbital branch of the fifth pair, it may possibly be removed by the complete division of the wounded nerve, or the excision of the cicatrix. In some cases, where it has arisen from the irritation of a carious tooth, immediate restoration of vision has followed the removal of the offending cause.

GLAUCOMA.

Amaurosis is a general term employed to designate that condition, in which loss of vision, partial or complete, is unaccompanied with any alteration in the transparency of the parts anterior to the retina, or any morbid

change in the eyeball. Glaucoma is more particularly distinguished by a greenish discoloration of the pupil, a fluent condition of the vitreous humour, and induration or unusual hardness of the globe; but though thus differing from amaurosis in some of its objective symptoms, is always attended with defective sight from implication of the retina, and, in the discrepancy which prevails respecting the tissue primarily involved, may not improperly be included in the same category with that disease. Deviations so trivial are, indeed, hardly sufficient to entitle it to the rank of an independent affection, but a separate position is assigned to it by most writers on ophthalmic surgery, and it is in compliance with general custom that it is so treated in the present volume.

The seat of morbid action has been variously attributed to the hyaloid membrane, retina, or choroid, and there is still some uncertainty as to which of the three it is properly referred; the invariable lesion of the first, renders probable the supposition that it is the tissue in which it originates; but this is a matter of little practical moment, as they all become implicated in its progress.

It is the result of a deep-seated inflammatory process of a very chronic character, and is principally characterized by a greenish opacity at the bottom of the eye, with more or less impairment or total loss of vision. In its formative period pain is usually present, intermittent or constant, slight or severe, in different cases, generally situated over the brow, and accompanied with a sense of fulness or tension in the globe, which acquires a preternatural hardness from the increase of its fluid contents. The iris is tardy in its action, and, in most instances, ultimately becomes motionless. The pupil,

though often little affected in the early stages of the complaint, becomes dilated in its progress, is sometimes slightly irregular, and exhibits, instead of its usual dark colour, a yellowish or sea-green cloudiness, which is at first circumscribed, concave, and deeply-seated, but is afterwards more uniformly diffused through the interior of the eye. It is less perceptible when examined laterally than in front, and is evidently situated behind the pupil; apparently retreating still further when the aperture is dilated by belladonna. Vision is impaired in various degrees, and not always in proportion to the opacity. Its declension and the progress of the discoloration are often very gradual, extending sometimes through a period of several years; and, as in amaurosis, coruscations or luminous flashes are not unfrequent when the globe is moved. In a recent case, in which there was a congenital deficiency of the pigmentum nigrum, a bright light produced a painful or disagreeable impression, and a yellowish suffusion of objects was a prominent subject of complaint. As the insensibility of the retina increases, a brilliant illumination is required; and when the sight is quite extinguished in front, the patient is often still capable of perceiving with tolerable distinctness objects situated towards the side. The lens itself may eventually become opaque, owing to the interruption of its nutrition from the destruction of the hyaloid membrane; and when the disorganization has reached this extent, is liable to be suddenly detached from its ciliary connexions, and sink below the pupil. The eye being thus a centre of irritation, the balance between the exhalent and absorbent vessels is destroyed, and the aqueous humour accumulates in undue quantity, imparting an unnatural firmness to the globe, and probably having

some agency also, in producing the insensibility of the retina, and the absorption of the black pigment.

The pathological changes have been already partly anticipated. The vessels of the choroid have been found more or less varicose, its colouring matter absorbed, and the retina variously altered by lymphatic deposition. The vitreous humour, though always in a state of dissolution from the destruction of the hyaloid septa, and often slightly tinged of a yellowish or greenish hue, is usually pellucid; and, according to Mr. Mackenzie, the lens, while yet preserving its transparency, assumes an amber, or reddish-brown colour, especially in its centre. To the reflection of light from a surface deprived of its pigment through a crystalline thus discolored, that gentleman ascribes the peculiar appearance which gives its name to the disease.

Glaucoma is sometimes associated with inflammation of an arthritic character, in which the investing membranes are more actively involved. Under such circumstances, the pain is more aggravated, the ocular spectra luminous and frequent, and vision, rapidly impaired from the beginning, is finally extinguished altogether. The sclerotica, attenuated by the internal pressure, exhibits a bluish discoloration; the lens becomes opaque, constituting what has been called *cataracta viridis*, or *glaucomatosa*; the iris, altered in structure, and adherent by its lesser circumference to the crystalline capsule, is protruded towards the cornea; and an assemblage of symptoms is presented, which, from the variety of the tissues implicated, might be properly designated *ophthalmitis interna*.

Glaucoma is sometimes mistaken for cataract, and the error is the more likely to happen in those cases in which

the pupil retains its ordinary dimensions. An intelligent consideration of the symptoms just enumerated, will, however, readily establish the diagnosis; and assistance may be also derived from a catoptric examination; the phenomena of which, however, evince some peculiarities from the change in the colour of the lens.

It is said to be more prevalent in some countries than in others, and generally occurs after the middle period of life; affecting more particularly those who have been accustomed to the indulgence of appetite, and especially to the use of spirituous potations. Both eyes are often simultaneously affected, and when it commences in one, the other usually soon participates in the morbid action.

Owing to the insidiousness of its approach, it often happens that this affection has made considerable progress before application is made for surgical assistance, and the prognosis—unfavourable under any circumstances—is consequently very discouraging. In the incipient stage, the march of the symptoms may sometimes be arrested by the employment of antiphlogistic remedies—the local abstraction of blood by leeching or cupping, active cathartics, diuretics, &c.,—counter-irritation between the shoulders by the tartrate of antimony, a regulated diet, repose of the organ, and the alterative use of mercury; but when the disease is completely formed it may be regarded as incurable. In the depraved condition of the system in which it frequently appears, attention to the due performance of the cutaneous and digestive functions, and the invigoration of the constitution by exercise and tonics, will always be proper; and, by improving the general health, may possibly produce a favourable change in the diseased organ.

While the iris retains its mobility, vision may be tem-

porarily improved by the extract of belladonna applied around the brow, or dropped in watery solution upon the eye. In the instance alluded to, in which a yellow suffusion of objects was a very distressing symptom, advantage was derived from the use of French goggles stained of a deep blue colour.

HEMERALOPIA. DAY-BLINDNESS.

Hemeralopia is sometimes described as an intermittent amaurosis, which makes its attack by day, and disappears on the approach of night. Dr. Hillary speaks of two cases as having fallen under his observation; and Boyer records his personal knowledge of an individual who was thus regularly attacked every spring for a long period of time. There is much vagueness, however, in the descriptions given by authors, and it is not improbable that different affections have been included under this appellation. Patients with mydriasis or unnatural dilatation of the pupil, and those also in whose eyes there is a deficiency of the pigmentum nigrum, are unable to endure the full brightness of the sun, and have their vision improved in the shade, or in the dusk of evening. Sensibility to light, amounting in some instances to photophobia, is often seen in hysterical females and delicate children, unattended with any symptoms of inflammation; and sometimes accompanies neuralgia of the nervus communicans faciei, or lesser sympathetic. Morbid irritability of the retina, indeed, however induced, whether by a disordered condition of the chylopoietic viscera, or some imperfection in the uterine functions; excessive employment of the eye on

minute objects; exposure to a bright light, particularly when reflected from a snowy surface, &c., &c., is adequate to the production of day-blindness, in the sense now intended; and as it thus manifestly depends on various and opposite causes, the treatment must be regulated by the circumstances of each particular case.

Individuals in whose eyes there is some impediment to the transmission of rays along the visual axis, from opacity, cataract, &c., see less distinctly by day, when the pupil is contracted, than towards evening, when the dilatation is greater, and admits the light around the circumference of the obstruction; but these are not the conditions usually comprehended under the term of hemeralopia.

NYCTALOPIA. NIGHT-BLINDNESS.

A defect, the reverse of that just described, in which vision, unaffected during the day, becomes impaired, or is altogether lost, as the light of the sun is withdrawn, is frequently observed in some climates, and is not of very rare occurrence in the southern parts of our own country. It is especially common among seamen, and the inhabitants of tropical regions; and prevails also in very high latitudes, where the earth, during a great part of the year, is covered with snow. The eye, under such circumstances, being constantly exposed to an undue degree of light, the sensibility of the retina becomes ultimately so far exhausted, that a feebler power than that of the sun does not produce an impression sufficiently strong for distinct vision. The complaint varies in its duration, from a few weeks to as many months, and is very

liable to relapse while the individual continues to be subjected to the cause which originally produced it. It is said to be sometimes symptomatic of gastric or intestinal derangement. Of several hundred cases, treated by Mr. Bamfield in different parts of the world, and particularly in the East Indies, all perfectly recovered, and it would hence appear that the prognosis is unusually favourable; though if neglected, or improperly treated, it is described as terminating occasionally in incurable amaurosis.

A mild antiphlogistic treatment,—local depletion, saline aperients, &c.,—with the exclusion of light, may be necessary in some cases; and when any gastric derangement exists, appropriate measures should be adopted for its correction. Mr. Bamfield trusted chiefly to the repeated application of blisters to the temples, and states that it has succeeded in effecting a cure in every instance of idiopathic nyctalopia that has fallen under his observation. It will be proper in all cases to enjoin the avoidance, as far as practicable, of the exciting cause, and to recommend a change of climate when relapses cannot otherwise be averted.

The Esquimaux Indians, who inhabit a region covered with perpetual snow, preserve their eyes from its injurious influence, by a kind of goggles, formed of wood or ivory, and so contrived as to admit light only through a narrow slit; the instrument both protecting the organ, and increasing the power of vision.

HEMIOPIA. VISUS DIMIDIATUS.

Hemiopia is a species of imperfect or partial amaurosis, in which the individual can discern only one half

of an object ; and the division may be either horizontal or perpendicular,—the latter being the most common. In some instances it is the centre, or the circumference only, that is visible ; but these varieties are of still less frequent occurrence. The imperfection of vision within the field affected, varies in degree, from dimness or obscurity merely, to total blindness,—the sight being unimpaired in other directions,—and is sometimes attended with pain in the orbit and about the temple. It affects one or both eyes, is often sudden in its attack, and may be either permanent or temporary. Congestion of the brain, and other morbid conditions of that organ of more permanent character, are occasional causes of this affection ; it sometimes originates in dyspepsia, and is not unfrequently a mere nervous phenomenon, connected with hysteria or hypochondriasis. In one instance which lately came under the notice of the author, it arose from insensibility of a portion of the retina, produced by undue employment of the eye in microscopical examinations, conducted in the full light of the sun.

The treatment will vary according to the etiology of each particular case,—depletory measures being indicated in one instance, emetics, aperients, and alteratives, in another, and tonics and chalybeates, in a third. In the case to which allusion has just been made, advantage was derived from leeching, and the repeated application of a blister to the temple.

DIPLOPIA

Or double vision, has been mentioned as a common symptom in the early stage of amaurosis, and is occa-

sionally also a precursor of apoplexy. It depends upon a want of parallelism between the eyes, by which their correspondence in certain directions is destroyed, and disappears of course, when one eye only is open. The deviation is so slight as not to be apparent to the observer; and the duplication of objects which it produces, does not in general accompany strabismus, because, owing to the defective vision of the distorted organ in that complaint, the impression made upon it is disregarded. In a case recently under treatment, where the individual, a teacher by profession, had passed the middle period of life, there was an evident difference in the focal distances of the eyes; and the defect was thought to have some connexion with the constant exercise of those organs, particularly with the visual effort required to prepare the pens for a large class. It has been attributed to paralysis of the central portion of the retina, is said to be occasionally symptomatic of gastric derangement, and is sometimes caused by irregular action, spasm, or disability of one of the straight muscles.

The treatment will vary according to the nature of the complaint, but it will be proper in all cases to avoid the causes which may be supposed to have produced it: when it arises from cerebral congestion, it conveys important admonition of the necessity of venesection and other depletory measures. In the case alluded to, after the removal of some general disorder, the patient was recommended to procure a glass which would correct the focal disagreement, and to exchange, for a season, his school for the country.

ACROMATOPSIA.

Inability to distinguish colours is not of very unfrequent occurrence, and exists in various degrees, from difficulty in the perception of shade merely, to the recognition of only one or two of the primitive rays,—those of yellow and blue being the most constant. The imperfection, which is usually congenital, is sometimes hereditary; and, in a few instances, has appeared to be symptomatic of certain abnormal conditions of the brain, as congestion of that organ, or depression of the cranium from external injury. Like the kindred anomaly of insensibility to musical sounds, it is a sensorial defect,—the eye being healthy, and vision in all other respects unaffected—and, in its idiopathic form, is rather a subject for the investigation of the curious, than one possessing any practical utility.

OCULAR SPECTRA. VISIO PHANTASMATUM.

False visual impressions, as lucid spectra, scintillations, dark motes, &c., have been already mentioned as a common symptom in amaurosis, and several of the internal ophthalmiæ; they occur also as a mere nervous, or hypochondriacal affection; and are sometimes of more serious import, as prelusive of various forms of sensorial derangement,—convulsions, apoplexy, epilepsy, &c. When they assume the appearance of luminous figures, as flashes or globes of fire, bright circles, points, streaks, &c., the complaint is called photopsia, pyropsia,

or pyrotic vision; if objects, as a lighted candle, are seen surrounded by a prismatic halo, or tinged with a colour—green, blue, yellow, &c.,—different from that which they naturally possess, it is termed *chropsia*, or *chromopsia*; and when they appear distorted or deformed, it is styled *metamorphosia*, or *visus defiguratus*. Children, individuals of nervous temperament, and persons addicted to the use of opium and other stimulants, are often annoyed by fanciful images of various kinds, as hideous faces, stars, and different uncouth representations; they are very common in the mental aberration attendant upon fever, and are, more particularly, a distressing accompaniment of that form of cerebral disorder denominated *delirium tremens*. Under these circumstances, they occur quite independently of the presence of light, and are familiarly known to be produced without such agency, in the act of sneezing, sudden pressure upon the eye, galvanic influence, &c.

As a symptom indicative of congestion of the brain, *photopsia* acquires additional importance; and, if timely heeded, may lead to the adoption of measures preventive of apoplexy, and other serious maladies thence arising. If it originate in functional derangement of the digestive organs, aperients and alteratives should be prescribed, and such other means adopted as may tend to restore their healthy condition.

PHOTOPHOBIA.

Intolerance of light is a common symptom in most inflammatory affections of the eye, and exists in a remarkable degree in that modification known under the

name of strumous ophthalmia. It is seated in the ophthalmic branches of the fifth nerve, and consists more particularly in an exaltation of the function of those filaments from the lenticular ganglion which are distributed to the retina, and endow that membrane with sensibility to the influence of light. As a form of neuralgia, wholly unconnected with inflammation, it is not unfrequently met with among females, and may continue for years without producing the slightest organic change in any of the tissues. The proper function of the retina—the reception of visual impressions—is perfectly unimpaired; for the patient, though incapable of enduring any considerable degree of light, is able to see with usual distinctness in the shade, or at the approach of evening. All exertion of the eye upon minute objects is attended with pain or uneasiness, and the individual, often to her great inconvenience, is consequently precluded from reading, needlework, &c. During the exacerbations to which, in some instances, the complaint is subject, the intolerance is occasionally so considerable that any bright light, as the reflection of the sun's rays from a carpet, is quite insupportable. It occurs most commonly in persons of impaired health, or nervous temperament, and is very often dependent upon some defect in the performance of the digestive or uterine functions,—not unfrequently appearing in connexion with that morbid condition of the chylopoietic viscera which gives rise to sick headache. The exciting cause is sometimes so trivial as to escape notice, but it may generally be traced to undue exertion of the organ; and in a recent case of strong hysterical predisposition, where the photophobia attained a high degree of development, it

was induced by a slight imprudence in reading by twilight.

Persons unacquainted with the nature of this affection are apt to attribute it to inflammation of the retina, and apprehensions are entertained lest it should be precursory of amaurosis. Under this erroneous impression, it is sometimes attacked by the whole array of antiphlogistic measures—general and local depletion, purgatives, counter-irritation, rigid seclusion in a darkened apartment, &c., &c.,—without any other result than that of enfeebling the general health, and increasing the severity of the disease. An instance illustrative of this remark, fell under the notice of the author, some years ago, in which a lady was confined by her physician—a country practitioner of more than ordinary merit—for a period of several months to a chamber perfectly dark, and in the belief that she was suffering from an inflammatory affection of the retina, actively treated as above mentioned. Her health declining, as might have been expected, in consequence of such practice, she was sent to the seashore, where she greatly improved; and the cure was completed on her return, by exercise on horseback and other appropriate measures.

The removal of functional derangement, and the steady employment of means calculated to cheer the mind, invigorate the constitution, and allay the irritability of the nervous system, are the indications to be fulfilled in the management of this complaint; and as these are sometimes of very difficult accomplishment, the cure is often tedious in its progress. Alteratives, aperients, and tonics, as the preparations of iodine with the syrup of sarsaparilla, the compound decoction of aloes, chalybeates, qui-

nine in union with myrrh and the exsiccated sulphate of iron, the vegetable bitters, valerian, the shower-bath, or frictions over the surface with a wet towel, exercise in the open air, travel, a jaunt to the sea-shore, &c., all tend to the restoration of healthy action, and will severally be found more or less useful in different cases. Frictions around the eye with ether, alone or combined with ammonia, sometimes afford temporary relief; but little else of topical prescription is required, as the local disorder originates in the perverted action of other parts, and participates in the general improvement.

DISEASES OF THE IRIS.

IRITIS.

THE nervous and vascular structure of the iris, its exposure to external injury, and its sympathies with various morbid conditions of the system, render it extremely prone to inflammation; which may be either simple, or complicated with syphilis, rheumatism, gout, scrofula, &c. The general symptoms, however, are so much alike in all these cases, that it would be difficult, without reference to the constitutional predisposition of the patient, or other circumstances connected with his history, to determine the real character of the complaint in any particular instance. It is not a little remarkable that though inflammation of this tissue is open to free inspection in all its stages, and must therefore have been a familiar subject of observation to medical men, the first published account of the disease should have been that of Schmidt, in 1801.

SIMPLE ACUTE IRITIS.

One of the most obvious symptoms of inflammation of the iris, is the appearance of a radiated zone or wreath, of a pink or brick-red tint, encircling the cornea, and formed by the minute ramifications of the anterior ciliary arteries, which advance in separate trunks upon the sclerotic, and at the distance of a few lines from its anterior

margin, subdivide into numerous branches before they penetrate the external coats in order to pass to their ultimate distribution. This vascular band, which may be either partial or complete, varies in breadth in different cases; and is more or less distinct, according to the extent, degree, and stage of the inflammation. The vessels terminate abruptly at the circumference of the cornea, and in some instances, an interior white line may be observed immediately surrounding that membrane. The iris is thickened and prominent anteriorly, loses its brilliant fibrous appearance, becomes dull, corrugated or uneven, and acquires a yellowish, green, or reddish hue, according as it was previously light, blue, or dark-coloured;—changes which may be easily detected by comparing the inflamed with the sound eye. These alterations commence at its inner circle, gradually extend to the ciliary margin, and are chiefly caused by lymph deposited interstitially, or effused externally, and usually upon its posterior surface in the immediate neighbourhood of the pupil. In the progress of the inflammation, dilated vessels and spots of extravasated blood are occasionally seen on the iris, and, in some rare instances, small abscesses form, and discharge their contents into the anterior chamber. The vascularity of the conjunctiva, though not in general very strongly marked, is sometimes so great as to mask the peculiar brick-like redness of the sclerotica, and, without reference to its appropriate symptoms, the disease might, on first glance, be mistaken for conjunctivitis. In a more advanced period of the complaint the cornea often becomes dull or opalescent, the aqueous humour is more or less turbid, and the pupil, which consequently exhibits a clouded or hazy appearance, is contracted, irregular, and

motionless,—the irregularity frequently assuming an angular form. The contraction is occasionally so considerable that it is almost entirely obliterated; or the aperture is obstructed by lymphatic deposition, which produces effects according to its quantity,—from a slight confinement of the margin at one or more points, often perceptible only in a moderate light, or when the part is under the influence of belladonna, to complete closure of the opening, and adhesion to the capsule of the lens. The lymph appears in various forms,—occupying the pupil in a dense white mass, constituting what has been called lymphatic cataract, fringing its circumference, extending in filaments across the aperture, or deposited in spots of a yellowish or rusty colour upon the anterior plane of the iris, and sometimes effused from the uvea in quantity so great as to fill the posterior chamber, and protrude the membrane towards the cornea. Intolerance of light, lachrymation, dimness of vision, and pain, deeply seated, circumorbital, and generally aggravated at night, are present in different degrees, according to the severity of the inflammation; and the disease, if not arrested by nature or art, progressively involves the other tissues,—the choroid, retina, and membrane of the aqueous humour,—and sometimes extends also to the external tunics. The constitutional disturbance in the severer forms of the complaint is often considerable; and the advance of the symptoms is, in some instances, so rapid that vision is irretrievably lost in a few days.

The inflammation may terminate by resolution, suppuration, or lymphatic exudation. Effusion of pus, producing hypopion, may take place in either chamber, but this is comparatively a rare occurrence,—the extravasation of coagulating lymph being much more common.

The consequences of this effusion, which have been partly anticipated in the description just given, may be summarily stated, as, discoloration of the iris, corrugation, thickening, consolidation, and other changes of texture, impairing or destroying the mobility of the membrane; adhesion to the cornea on the one hand, or the crystalline capsule on the other, constituting the conditions respectively denominated synechia anterior and posterior; irregularity of the pupil, and closure of that opening, either partial or complete,—the atresia iridis completa and incompleta of authors; impairment or destruction of vision, &c., &c.

Iritis, as intimated in the preliminary remarks, may be either idiopathic, traumatic, sympathetic, syphilitic, strumous, rheumatic, or arthritic. It is also divided according to its progress, into acute, sub-acute, and chronic; the two latter varieties are sometimes mistaken for amaurosis, by reason of the very defective vision with which they are accompanied from the implication of the more deeply seated tissues, but the diagnosis is easily established; they often involve more particularly the uvea or posterior surface of the iris, and have received from Dr. Simeons the appropriate designation of chronic uveitis.

Causes.—Direct mechanical irritation, whether produced by injuries inflicted accidentally, or in the performance of surgical operations; extension of inflammation from the neighbouring parts; exposure of the iris from wounds or ulcers of the cornea; the combined influence of light and heat; any undue or prolonged effort on the part of the eye, especially in viewing minute and brilliant objects; cold; damp; and other less appreciable agencies; are the ordinary causes of iritic

ophthalmia. It is not uncommon during the warm weather of summer, especially in seasons when the heat is unusually intense; and all the circumstances mentioned, are more particularly operative in certain unhealthy states of the system.

Prognosis.—In recent cases, previously to the occurrence of any structural derangement, the prognosis is always favourable, and even when the inflammation, though accompanied with contraction of the pupil and extravasation of lymph, is still confined to the iris, the patient often regains a very useful degree of vision; but where the disease has been of long duration, and has involved the investing membranes and internal parts of the organ, with change of colour, thickening and corrugation of the iris, and obliteration or obstruction of the pupil, recovery is altogether hopeless. If the organic lesions are less considerable and extensive, the retina uninjured, and the impediment consists chiefly in occlusion of the aperture, vision may perhaps be restored by an artificial opening, provided the loss of the other eye should render such operation expedient.

Treatment.—The principal danger in iritis arises from the effusion of coagulable lymph,—an occurrence which can only be prevented by the timely adoption of judicious and efficient measures. Venesection should never be omitted when the state of the constitution will permit its employment; and the local abstraction of blood by leeching from the temples, or cupping from the back of the neck—repeated as circumstances may require—with an active cathartic in the beginning, followed by saline laxatives, and the rigid observance of the whole antiphlogistic system, will always be proper. From the exposed situation of the membrane, its morbid and re-

cuperative changes are all open to observation, and the beneficial effects of remedies are consequently more apparent than in many other forms of disease. A very evident improvement is produced by depletion; and it is here also, that mercury most conspicuously displays its sanatory powers in arresting the inflammation, and thereby preventing the deposition, or promoting the absorption of lymph. It should be early administered in such quantity as will bring the system under its influence with the least possible delay, and it is sometimes necessary to continue its impression through a period of several weeks. Full salivation is not absolutely required; in many instances, indeed, it may be prudently avoided; but it generally exerts a more decided effect upon the symptoms, and when these assume a threatening aspect, the importance of the organ imperiously demands the adoption of those means which will best preserve its integrity.

The alterative action of the remedy having been produced, it will be desirable to exhibit it less frequently, and the iodide of potass with the neutral mixture and the *vinum colchici*, may be appositely prescribed in further fulfilment of the same indication; the patient should be secluded from the light; mustard pediluvia employed in the evening; and, if necessary, sleep procured by the use of morphia or the compound powder of *ippecacuanha*.

Particular attention should always be directed to obviate the contraction of the pupil, by the application of belladonna to the brow; and though it unfortunately happens that this narcotic exercises comparatively little influence over the membrane in a state of active inflammation, it should, nevertheless, be maintained in constant

readiness to produce its operation as the nervous excitement and vascular turgescence subside. The *datura stramonium*, a plant of universal diffusion, possesses the power of dilatation in equal degree with the *belladonna*, and the fresh leaves, bruised and bound over the eye, may be substituted with advantage, when this article cannot be procured. Dr. Stoeber strongly recommends a solution of atropine, or Oehler's essential extract of henbane, dropped upon the conjunctiva, and when these preparations are not at hand, frictions around the orbit with the extract of *belladonna* or *henbane*, incorporated with the *unguentum hydrargyri*. The efficacy of the ointment might be increased by a small proportion of the protiodide of mercury, and the further addition of one of the preparations of morphia, would also be useful in preventing irritation, and allaying the severity of the nocturnal pain.

Mr. Houston relates the following interesting case, derived from Dr. Ryan, in illustration of the property possessed by *belladonna*, of producing dilatation of the pupil.

"The individual, a man aged about forty years, had been blind for six weeks, in consequence of syphilitic iritis. Two of the most experienced physicians in the city of Kilkenny, had declared him incurable, and on their certificate to that effect, he was pensioned by the corporation. Both pupils were very much contracted, and filled by an apparently organized layer of lymph. Vision was completely lost. The treatment consisted in rubbing the circumorbital regions with a solution composed of a drachm of the extract of *belladonna*, in an ounce of water, three times a day; and in the rapid exhibition of mercury, until salivation was induced.

The pupils dilated, the semi-organized lymph was absorbed, vision was restored, the man returned to his situation as weigh-master to the corporation, and a complete cure was obtained."

Local applications, besides those already mentioned, are not of much value in the treatment of this affection, but fomentations with warm water and laudanum may be employed when the accompanying conjunctivitis is considerable. Counter-irritation is a useful auxiliary after the acute symptoms have been subdued by the depletory measures, and may be excited by the application of a blister to the back of the neck, or of the tartrate of antimony between the shoulders. Frictions over the brow with laudanum alone, or combined with ether or ammonia, are also serviceable.

Mr. Carmichael warmly recommends the internal exhibition of the oil of turpentine, in the quantity of a drachm three times a day, if from any cause a substitute for mercury is desired, and its utility in such contingency has been confirmed by the testimony of others. The iodate of potash may also be usefully prescribed under like circumstances.

When the iritis has assumed a chronic form, and the patient has been much debilitated by the previous treatment, the sulphate of quinine may be usefully combined with the mercury, or the tincture of guaiacum, in the quantity of a drachm three times a day, exhibited concurrently with that alterative; and if, under these circumstances of atonic action, there should be a congested state of the external vessels, the vinum opii, or some other gently stimulating application, may be employed with advantage.

SUB-ACUTE AND CHRONIC IRITIS

Are sometimes merely the subsequent stages of the acute form, but they may also occur as primary or idiopathic affections. The inflammation, in these varieties, is tardy in its developement, and commonly very insidious in its progress. The alteration in the colour and brilliancy of the iris is usually first perceptible in its lesser circumference, the pupil is sluggish in its motion, there is little redness or pain, and the patient complains chiefly of dimness of vision, which is sometimes so gradually and imperceptibly impaired, that when the disease has affected one eye only, the sight has been lost before he was aware of his misfortune. The degree of amblyopia, indeed, is frequently more than proportionate either to the intensity of the other symptoms, or the obscuration of the pupil,—a circumstance which may, perhaps, be explained by the vascular turgescence of the choroid and retina, if not their actual participation in the inflammatory action. In many instances the uvea, or the serous membrane covering the posterior plane of the iris, appears to be principally or almost exclusively involved; the proper tissue of this curtain being so slightly implicated, that its morbid changes are scarcely discernible, even when examined with the microscope. It is in such concealed modifications—appropriately termed uveitis by the German writers—that the disease has been sometimes mistaken for amaurosis. The lamina or surface in question, is exceedingly delicate in its organization, and its proneness to inflammation is evinced by the adhesions—often

accompanied by very slight traces of vascular excitement—which it occasionally contracts with the crystalline capsule, after the operation for the removal of the lens by absorption. It frequently happens, that when first consulted in the subacute form of the complaint, the various changes peculiar to iritis may be detected in the iris and pupil; and lymphatic extravasation,—hanging from its margin, stretching across the opening like a thin membranous film or web, or connecting it at one or more points with the capsule of the lens,—may have already commenced, even at this early period. The disease is often complicated with inflammation of the membrane of the aqueous humour, evinces a strong disposition to relapse, and its terminations, when it has been permitted to continue long, are the same as those of the acute species.

The treatment consists in the employment of the remedies already designated for iritic inflammation—general and local depletion, mercury to the production of gentle ptyalism, the iodide of potash with the neutral mixture and the *vinum colchici*, saline laxatives, mustard pediluvia, counter-irritation, &c.,—to an extent commensurate with the urgency of the symptoms. The complaint in this form is often extremely unmanageable, partly owing to the implication of the posterior tissues, and partly also, perhaps, to the mildness of the symptoms preventing the timely adoption of decided measures: as it is frequently associated with depraved conditions of the constitution, it is important to ascertain the particular diathesis in which it appears, in order that the means to be instituted for its cure may be regulated accordingly.

SYPHILITIC IRITIS.

Inflammation of the iris is not an uncommon occurrence among the secondary symptoms of syphilis, and may either precede the other constitutional affections,—the cutaneous eruption, ulceration of the throat, periosteal pain and swelling—or makes its appearance simultaneously with them. It is said to be more frequently observed after chancre which has been cured without mercury, than under opposite circumstances. Writers have attempted to discriminate between this and the other varieties of iritis, but the local symptoms do not appear sufficiently distinctive to afford any very certain ground of diagnosis. The disease is generally accompanied with some indications of constitutional depravation,—anorexia, debility, sallowness, &c.,—and is remarkable for its gradual advancement, and the extent and complication of its morbid alterations; frequently involving in its progress every tissue which enters into the composition of the organ, and terminating in destruction of vision, attenuation or staphylomatous projection of the sclerotica, and total disorganization of the eyeball. It has been supposed to be more particularly characterized by the brownish hue of the vascular zone around the cornea, a similar discoloration of the inner circle of the iris, the rusty or cinnamon colour of the lymphatic deposition, and the peculiar irregularity of the pupil, which is drawn in an angular direction towards the root of the nose,—a circumstance more apparent from the fact that the iris is narrower on the nasal, than on the temporal side of that opening. Dif-

ference in degree is, however, a very uncertain ground of discrimination, and the symptom last mentioned, being produced by some affection of the ciliary or iridal nerves, appertains more properly to inflammation of the choroid membrane, the implication of which it therefore indicates.

In the progress of the disease, the lesser circle of the iris sometimes becomes thickened, corrugated, inverted, and adherent throughout its circumference to the capsule of the lens; while the membrane of the aqueous humour being inflamed to a greater extent than in simple iritis, its secretion is rendered turbid, and the cornea also sooner grows nebulous.

The symptoms above enumerated, may excite a well-founded suspicion of the nature of the complaint, but the history of the case, revealing the co-existence of other secondary affections, will afford the surest diagnosis. Any difficulty, however, which may occur in establishing this point, is the less to be regretted, inasmuch as the treatment differs in no respect from that prescribed for idiopathic iritis; though as occurring in a vitiated condition of the system, general depletion does not usually require to be carried to equal extent. It is in this variety that the oil of turpentine is more particularly recommended; and when, from any cause, mercury is inadmissible, it may furnish a useful resource.

RHEUMATIC AND ARTHRITIC IRITIS.

By some writers the several varieties of iritis are described with great minuteness of detail, but, as already intimated, the distinguishing features are not very

strongly marked; and, for the most part, it is only from an acquaintance with individual idiosyncrasy, or a previous knowledge of the cause, that a positive opinion can be formed of the nature of any particular case.

When iritis occurs in arthritic subjects, the sub-conjunctival vessels, especially after the disease has continued for some time, become enlarged and varicose, the eye assumes an unhealthy appearance, the sclerotica is attenuated and discoloured, and the vascular wreath around the cornea has a livid hue, in some instances almost approaching to purple, with an interior whitish ring, which is most perceptible towards the canthi. There is also greater liability to inflammation of the choroid and retina, the irregularity of the pupil more frequently assumes an oblong deviation towards the inner and upper part of the eye, and occasionally the posterior chamber exhibits a dull greenish appearance, from disorganization of the hyaloid membrane and other morbid changes. With these exceptions, neither this nor rheumatic iritis appears to differ from the modifications already described, unless it be in the greater tendency to relapse, which renders the prognosis in the arthritic variety—fortunately less frequent in its occurrence—more unfavourable than in any other. In many cases, where such morbid predispositions exist, the eye is subject to repeated attacks of inflammation, recurring annually, until vision, progressively impaired by each succeeding invasion, is at length completely extinguished.

Treatment.—The antiphlogistic plan is equally applicable to this, as to the other forms of iritis; regard being had to its constitutional modification, and the enfeebled condition of the system with which it is frequently associated. Mercury is perhaps less decidedly

useful in arthritic iritis, but much advantage may nevertheless be derived from its employment as an alterative, in conjunction with measures which tend to improve the vitiated condition of the chylopoietic viscera. In the rheumatic variety, which is generally preceded or accompanied by kindred affections in other parts of the body, it displays its wonted influence; but more than ordinary care is required to guard against relapse. In every instance the tendency to contraction in the pupil should be resisted by the application of belladonna to the brow, and this extract, blended with morphia and mercurial ointment, may likewise be employed in frictions to relieve the nocturnal paroxysms of pain. Medicines which promote the renal secretion are more particularly indicated in these cases, and the *vinum colchici*, variously compounded with articles of similar tendency, may frequently be prescribed with much advantage. Counter-irritation is also an important auxiliary, and it may be desirable, in certain contingencies, to make use of means—the tartrate of antimony, ammoniacal liniments, &c.,—which will produce this result without much accompanying discharge; in some cases it has appeared to exert a better effect when excited at a distance from the seat of disease, and mustard pediluvia, sinapisms to the extremities, &c., may be directed with that view. In persons of irritable or impaired constitutions, a combined alterative and invigorating treatment is demanded, and the sulphate of quinine with a small proportion of calomel or the *pilula hydrargyri*, the oil of turpentine, the preparations of iodine in conjunction with the syrup of sarsaparilla or the compound decoction of aloes, the tincture of guaiacum, &c., &c., according as circumstances may lead to the preference of

either, are often more or less serviceable in different cases. The article last mentioned may also be usefully administered in the formula of Dr. Ryan, (p. 194.) It is given in the quantity of a table-spoonful every two or three hours, and is also recommended by him in gout, secondary syphilis, and chronic rheumatism with thickening of the joints, &c.

STRUMOUS IRITIS.

Inflammation of the iris, like the same process in other parts of the body, is not unfrequently modified by the lymphatic or scrofulous diathesis; and this modification is the form under which the disease most commonly appears in childhood. It is usually caused by the extension of morbid action in strumous corneitis, and where this is the case, the opacity of the cornea may be so considerable as to conceal the iris, and much mischief be consequently produced before the implication of that membrane is discovered. This is the more liable to happen, from the fact that some of the symptoms,—the zonular redness, supra-orbital pain, and impaired vision,—are common to both affections. The condition of the iris should, therefore, be carefully inspected in every instance, and when it is found to be inflamed, local depletion, calomel, the iodate of potash, the application of belladonna to the brow, and frictions with mercurial and iodated ointments, early resorted to, in conjunction with counter-irritation and the other appropriate remedies for strumous ophthalmia.

The tonicity or contractility of the dilated vessels in these, and other cases of inflammation, is chiefly restored

through the operation of general influences, and there is, therefore, no incompatibility between the simultaneous adoption of a mild tonic course, and the relief of local irritation and congestion, when they are present in such a degree as to threaten organic alteration, by the topical abstraction of blood. In an entonic state of the system, or in constitutions of ordinary vigour, the restorative powers of nature are generally adequate to the resumption of healthy action after the march of the disease has been arrested by depletory measures; but under opposite circumstances they may be essentially aided by the judicious prescription of alterative and invigorating medicines. The sulphate of quinine, the preparations of iodine, the tincture of guaiacum, &c., are equally proper here as in inflammation similarly modified affecting the other tissues, and, when the antiphlogistic treatment has been carried sufficiently far, are often productive of the happiest results.

PROLAPSUS OF THE IRIS.

Prolapsus of the iris is a common occurrence after wounds, ulcers, or sloughing of the cornea, and is frequently attended with severe pain from the constant irritation to which the exposed and sensitive membrane is subjected from the action of the lids. When the protrusion has taken place in consequence of the two causes last mentioned, the opening is generally large, and the prolapsed portion of the iris assumes the form of a convex, dark-coloured tumour, which sometimes attains a considerable magnitude. It has received different appellations according to the form and extent of the projection,

as myocephalon, *helas*, *hylon*, *clavus*, *malum*, &c.; and when it occurs through several apertures, is denominated *staphyloma racemosum*. The pupil is drawn in the direction of the prolapsus, producing displacement and change of figure; and occasionally its whole circumference becoming involved in the opening, it is entirely obliterated. In some instances, the iris, weakened by disease, and distended by the posterior pressure, yields to its influence, and the aqueous humour is discharged; the orifice closing, the fluid re-accumulates, rupture again takes place, and this process of alternate waste and repair is several times repeated, until at length a firm cicatrix is formed, capable of opposing adequate resistance.

When prolapsus has occurred in consequence of the changes produced by inflammation, the vascular turgescence of the deeply-seated tissues tends still further to increase the protrusion, and requires, of course, a continuance of the antiphlogistic measures already in practice. Blood should be abstracted from the temples or the back of the neck, an active cathartic or infusion of senna with the sulphate of magnesia promptly administered, rest procured at night by the exhibition of morphia, and the palpebræ covered with a fold of moistened linen, as well to prevent motion, as to allay irritation. In the attempt to retrieve the mischief which ulceration produces, nature not only obstructs the opening in the manner described, but immediately sets about strengthening her work by producing adhesions between the iris and the cornea; and if the protruded portion be large, vision would be greatly impaired, and in many cases entirely lost, through her well-intended, but injudicious exertions, were it not for the more intelligent

interference of art. The extract of belladonna, reduced by water to the consistence of cream,—should be freely applied around the margin of the orbit, in order to promote the retraction of the iris, and if much pain be produced by the friction of the lids, the projecting part should be touched, at intervals of two or three days, by the nitrate of silver in substance or strong solution, with the view of allaying the extreme sensibility of the part, and thereby preventing it from becoming a centre of determination.

In prolapsus through the edges of a recent wound, if the patient be seen immediately after the accident, before adhesions have had time to form, replacement may sometimes be effected by gentle friction over the lids, and sudden exposure to a bright light; or an effort may be cautiously made to repress the iris with the blunt extremity of a probe. These manœuvres, however, which often fail, should not be persisted in to the extent of exciting irritation, and if they do not soon succeed, it will be better to await the extrication of the pupil through the agency of belladonna; provided the opening be not situated at the very circumference of the cornea, in which case its operation would be likely to aggravate the evil. The eyelids should be closed, covered with a light compress, the chamber darkened, and the patient confined to bed with his head elevated. If the tumour be large, and the source of much uneasiness, it may be touched with the pencil or solution of the nitrate of silver, as already directed.

In staphyloma iridis which has become confirmed, interference may be necessary to relieve the sympathetic irritation of the sound eye; occasional puncture with a cataract needle, followed by the application of the

nitrate of silver, may be tried in the first instance, and if this be not sufficient, the apex of the projection should be excised with the curved scissors, or removed by the knife, in the manner directed for the cure of staphyloma of the cornea.

ADHESION OF THE IRIS.

Synechia Anterior and Posterior.

Adhesion of the iris on its anterior or posterior surface is a frequent consequence of inflammation of that membrane, and often follows wounds or ulcers of the cornea, operations for cataract, &c. When the connexion is with the cornea, it is denominated synechia anterior, and is accompanied with opacity, irregularity of the pupil, diminution or obliteration of the anterior chamber, and impairment or total loss of vision, according as it is partial or general. The adhesion to the crystalline capsule or synechia posterior, may also occur at one point only, or involve the whole inner circle of the iris; the pupil, in the circumstances last mentioned, being immovable, and its margin drawn backwards: in this degree, also, it is often complicated with cataract. The partial adhesion may be either direct, or intermediate by filaments of effused lymph, and is particularly apparent under the influence of belladonna, when distortion of the pupil is produced, in consequence of the inability of the adherent portion to follow the movements of the rest of the iris. This aperture may likewise be obstructed by lymphatic effusion extending across and confining its margin as by an

adventitious membrane; which is sometimes of considerable thickness, and at others, a film so thin as to be scarcely perceptible. In every instance the sight is injured in proportion to the extent of the morbid changes, and not unfrequently vision is entirely destroyed;—a result which strongly indicates the propriety of adopting precautionary measures in all cases where adhesion is a probable occurrence. When the cornea and lens preserve their transparency, and a small segment only of the iris remains unadherent, a very useful degree of vision may be obtained through the agency of belladonna, either applied to the brow, or dropped in watery solution upon the eye. If the adhesion be complete, and the cornea only partially transparent, the case, though desperate, is not utterly hopeless,—escape from blindness being still possible through the formation of an artificial opening.

OSCILLATION OF THE IRIS.

Oscillation or tremor of the iris,—the membrane preserving its natural form and appearance—is a frequent accompaniment of congenital cataract and amaurosis; and is also caused by injuries which affect the hyaloid membrane, and produce absorption of the lens, as contusions, operations upon the eye, &c. It is more immediately dependent upon a dissolved or fluent condition of the vitreous humour, in consequence of the destruction of the septa in which it is enclosed;—the iris under such circumstances losing its natural support, and moving backwards or forwards with the undulations occasioned by the motions of the globe. The membrane itself is

probably in most cases paralytic, its mobility being either greatly impaired, or altogether destroyed; though it sometimes dilates and contracts in sympathy with the other eye, or expands under the influence of belladonna. The oscillation is generally attended with more or less imperfection, often total loss of vision, from insensibility of the retina, especially when it has been caused by contusion; and the affection, which does not admit of relief, is always indicative of a morbid state of the internal tissues.

There are several other conditions of the iris, of which the limits assigned to the present work will permit only a very cursory notice.

Paralysis of the membrane occurs from various causes affecting the iridal or ciliary nerves; and fungous excrescences sometimes grow from its surface without any assignable agency. They evince no malignity of character, are unattended with any activity of inflammation, and often yield to the influence of mercury or the iodate of potash, with mild antiphlogistic measures, and frictions with mercurial and iodated ointments. There are, also, congenital deficiencies of the iris, or aberrations in its colour, and in the outline of its pupillary margin. Occasionally it is entirely absent, and this defect, which is attended with intolerance of light, and frequent attacks of inflammation, is sometimes hereditary. The cordiform division, denominated coloboma iridis, is a common occurrence; the fissure—usually situated at its inferior portion—is prolonged to the margin of the cornea, and there is reason to believe that in some instances it is continued through the choroid and retina. Partial obliteration or absorption of the iris, has already been mentioned as a consequence of injury

affecting the ciliary nerves. It is commonly caused by a particle of stone or metal, which has penetrated the sclerotica in the immediate neighbourhood of the ciliary body, and the effused lymph with which nature endeavours to repair the lesion is often perceptible through the pupil.

MYDRIASIS. DILATATION OF THE PUPIL.

Preternatural dilatation of the pupil, with more or less imperfection and confusion of vision, constitutes the affection denominated mydriasis. It may be artificially produced by the application of belladonna to the brow, and is a common symptom in amaurosis, and various morbid states of the brain, as apoplexy, hydrocephalus, &c.; but these are conditions not properly comprehended under this head. When the dilatation is very considerable, the patient is much annoyed by a dazzling sensation, caused by the great volume of rays admitted into the eye, and not adequately concentrated upon the retina; objects appear smaller than natural, those at a distance are more distinctly seen than those which are near; and though in minor degrees of expansion, the confusion is less troublesome, vision is always better in a moderate light. The disease may exist uncomplicated with any other derangement, or in connexion with paralysis of the muscles supplied by the motor oculi; and arises either from some affection of that nerve, the fifth pair, or of those branches which proceed from the ophthalmic ganglion to the iris. It is distinguished from the insensibility of the retina which constitutes amaurosis, by the circumstance, that the

individual can see with usual distinctness through a small aperture, as a hole in a card; and also by the improvement which convex glasses effect in the perception of proximate objects. It may be caused by contusions, or injury inflicted in the operation for the extraction of cataract; and is, perhaps, still more frequently sympathetic of some intestinal irritation, as worms, undue fæcal accumulation, &c. Recovery is rare in the case first mentioned, but in the other, the cause being removed, there is a spontaneous tendency to contraction, which art can do little more than accelerate. The pupil may be made to contract temporarily, by any irritation applied to the surface of the eye, and in the treatment advantage is taken of this circumstance.

If symptoms of cerebral congestion or excitement be present, depletory measures will be required; gastric or intestinal disorder must be removed by the appropriate remedies; and contraction of the pupil directly produced by stimulating applications to the conjunctiva. The vapour of ammonia, the *vinum opii*, or the solution of strychnia (p. 222), may be employed with this view; and the more effectually to accomplish the same object, M. Serres recommends the cauterization of the cornea at some point of its circumference with a pencil of the nitrate of silver. Electricity or galvanism, and stimulating embrocations around the eye, are also occasionally useful. In most cases, the pupil, as already observed, gradually resumes its natural state of contraction; and the defect may meanwhile be remedied by spectacles so contrived as to admit light only through a small opening in the centre. Demours states that he has never seen mydriasis in both eyes. When

the complaint is congenital, it generally terminates in amaurosis.

MYOSIS. CONTRACTION OF THE PUPIL.

The opposite condition of undue contraction of the pupil is also symptomatic of many diseases of the eye and brain, and not unfrequently occurs as an idiopathic affection. It is sometimes induced by the habitual inspection of minute objects, in a strong or artificial light, in consequence of which, the iris, restricted within a narrower range of action, loses its power of complete expansion; and it is hence not uncommon in persons who make much use of microscopes, as watchmakers, jewellers, engravers, &c. It may be occasioned also by increased irritability of the nerves which endow the iris and retina with common sensibility to light, and, this condition being commonly dependent upon some visceral derangement, is usually observed in hysterical females, and individuals whose health is deranged from indigestion and other causes. The pupil preserves its regularity of outline, but is limited and sluggish in its motions, and vision is generally more or less impaired.

The treatment will consist in avoiding the exciting causes, and the employment of such means as may correct functional disorder and invigorate the system. All close application of the eye in reading, writing, &c., should be interdicted, and benefit may rationally be expected from travel, country exercise, &c. The dilatation of the pupil by belladonna tends only to increase the weakness of sight.

Obliteration or closure of the pupil, an occasional

result of inflammation, often complicated with adhesion to the cornea or capsule of the lens,—is termed synechsis, or atresia iridis; and may sometimes be obviated by the exhibition of mercury, and the persevering employment of belladonna. If these remedies should fail, one only resource remains in the formation of an artificial pupil.

ARTIFICIAL DILATATION OF THE PUPIL.

The artificial dilatation of the pupil by the local application of narcotics, is a practice of comparatively recent origin, and may justly be ranked among the modern improvements in this department of surgery. The credit of the discovery, or rather of having first directed to it the attention of the public—for it appears to have been long known, and previous incidental mention of it was made by several authors—is due to Dr. Samuel Cooper, by whom it was first announced to the Profession, in an inaugural dissertation on the properties and effects of the *datura stramonium*, presented to the medical faculty of the University of Pennsylvania in 1797;—anticipating by four years the publication of Professor Himly on a similar effect produced by the *hyosciamus*. Dr. Cooper's experiments were limited to the article just mentioned, but subsequent investigation has proved that the same property resides also in the *atropa belladonna*, the *hyosciamus niger*, and the *lauro-cerasus*. It constitutes a resource of great practical utility under a variety of circumstances;—in the internal ophthalmiæ frequently enabling the surgeon to preserve vision which would otherwise have been lost;

supplying a palliative remedy—the more valuable that its effects are hardly diminished by repetition—in many cases of cataract, synechia anterior, contraction of the pupil, and central opacity of the cornea; while it is of scarcely inferior importance in facilitating numerous operations on the eye, and assisting the diagnosis in many of the diseases of that organ. Belladonna is the article most frequently employed; the extract being softened with water, and spread around the margin of the orbit for the space of three or four hours. It should be applied the evening preceding any important operation, suffered to remain until the morning; and, if necessary, moistened occasionally, in order to insure its effect. A filtered solution, in the proportion of half a drachm to an ounce of water, dropped upon the conjunctiva, is more powerful in its influence, but being more liable to excite irritation, is less frequently used, except in cases where it is desirable to avoid delay. According to Reisinger, atropine and hyosciamine, the active principles of two of these plants, evince still greater power;—a single drop of a solution, containing one grain of the latter to a drachm of water, producing extreme dilatation, which in one instance continued during a period of seven days.

An ingenious explanation of the *modus operandi* of these substances, is given by Mr. Walker. He supposes that the branches of the third and fifth nerves, which unite to form the lenticular ganglion, preside respectively over the dilatation and contraction of the iris; the former being appropriated to the radiated, and the latter to the circular or orbicular fibres. Filaments from the same division of the fifth pair are also distributed to the palpebræ and forehead, and through this

nervous communication the narcotic influence is propagated to the sphincter fibres of the iris, which, owing to their extreme delicacy of structure, and the absence of any fixed attachment, are liable to paralysis from a degree of narcotism which would not otherwise be perceptible. The contraction of the orbicular fibres being thus temporarily suspended, while those supplied by the third pair preserve their energy unimpaired, the antagonism is destroyed, and dilatation is, of course, the result.

It is generally believed that the action of the iris is dependent upon the susceptibility of the retina to visual impressions, though there are several well-known phenomena—its frequent mobility in complete amaurosis, the patient being able at the same time to distinguish between light and darkness, the opposite condition of fixed and dilated pupil without loss of vision, its invariable activity in uncomplicated cataract however densely opaque, and its state of contraction during sleep when the functions of the retina are suspended—which are quite inexplicable upon this supposition. Later experiments have rendered it probable that the faculty of vision, and sensibility to the influence of light, are distinct attributes, residing in different portions of the nervous apparatus; the former being the exclusive function of the retina and optic nerve, and the latter an endowment conferred by the ophthalmic division of the fifth pair of nerves. Filaments of this branch, distributed to the retina from the lenticular ganglion, not only bestow upon this membrane sensibility to light, but enable it, through the medium of others appropriated to the iris, to control the size of the pupil, and thus to regulate the volume of rays admitted into the interior of the eye. It follows there-

fore, that vision may be perfect, while the sensibility to light is lost, and vice versa, that sensibility to light and mobility of the iris may remain after vision is entirely extinguished; an interesting case in illustration of the one, is related by Mr. Walker, and examples of the other are familiar to every practitioner. In the instance referred to, all the parts supplied by the fifth nerve were paralyzed on the right half of the face. The taste was much impaired, and the patient was unable to close the palpebræ of the affected side; but vision was perfect in both eyes, and, with the exception mentioned, they were quite natural in appearance. When brought near a gas-light, the left eye could not tolerate for an instant the intense brightness of the flame, while the other, though placed in almost immediate proximity, was completely insensible to its irritating influence. As common sensibility was restored under the operation of mercury and appropriate antiphlogistic measures, the organ regained also its susceptibility to the impression of light.

How far the healthy condition of the fifth nerve is necessary to the proper performance by the retina of its peculiar function, is a question which may be solved by future inquiry; the occasional production of amaurosis from lesion of the frontal branch and the irritation of a carious tooth, the photophobia of hysterical females, &c., afford abundant evidence of the sympathy which exists between them.

OCCLUSION OF THE PUPIL. OPERATION FOR ARTIFICIAL PUPIL.

When vision is destroyed by partial opacity and staphyloma of the cornea, or by permanent contraction of the

iris, whether simple, or complicated with adhesion to the cornea or capsule of the lens, cataract, or obstruction of the pupil from extravasated lymph, the unfortunate patient may still be permitted to cherish a hope of its restoration from the formation of an artificial opening; provided the condition of the several tissues be such as to warrant an operation for that purpose.

In recent cases of closure or obstruction of the pupil, the application of belladonna, steadily continued through a period of several weeks, in conjunction with the internal exhibition of mercury, frictions with mercurial or iodated ointments around the brow; and counter-irritation, with the appropriate remedies for opacity of the cornea, when the defect arises from this cause; will often produce a considerable improvement, though the morbid changes may be so extensive as to appear almost beyond the reach of art. In some instances, also, of central opacity, and partial synechia anterior, where there is no longer any prospect of effecting the absorption of the effused lymph, or of disengaging the iris by the treatment just mentioned, a good degree of vision may frequently be obtained, by the use, at intervals of two or three days, of the extract of belladonna, as directed under the preceding head. But where these measures are either inapplicable, or have been tried without benefit, an operation is the only resource.

As conditions favourable, if not indispensable to its success, the patient should be free from the actual presence of any constitutional affection; the globe exempt from any general disease, as dropsy, induration, flaccidity, varicosity, &c.; the choroid in its natural state, as indicated by the absence of bluish discoloration, or staphyloma of the sclerotica; the iris not materially

altered from its healthy structure; and the cornea at least partially transparent: all traces of inflammatory action must have disappeared, and the patient should be able to distinguish light from darkness; but this, however desirable, is not an essential prerequisite, since, owing to the density of the intervening obstruction, it may be sometimes wanting, though the retina is still capable of performing its appropriate office. It is improper, for obvious reasons, if one eye only is lost; and when useful vision is destroyed in both, that which is most perfect should be chosen for the operation.

The situation of the proposed opening will also require consideration. If the operator has the power of selection, the centre of the iris is the most eligible position; and when a lateral opening becomes necessary, the nasal is perhaps preferable to the temporal side, inasmuch as, under such circumstances, there would be a greater correspondence with the optic axis of the other eye; though the latter, recommended by Mr. Gibson as procuring for the patient a greater field of vision, is generally chosen on account of its more convenient performance. In many cases, however, there is no alternative, and the aperture must be made behind the transparent part of the cornea, wherever that may be situated.

The new opening is not susceptible of variation by the action of the iris, and as it is liable to partial reclosure from the efforts of nature to repair the injury inflicted in its formation, it should be rather above, than below the ordinary size of the pupil; the system ought to be placed, by previous preparation, in a condition favourable to the avoidance of inflammation; and where the capsule and lens preserve their transparency, that

mode of operation should, if possible, be selected, which will leave them undisturbed.

The prognosis depends upon the nature of the morbid alterations, and is unfavourable in proportion to the deviation of the organ from its normal condition; perfect recovery can hardly be expected except under the most propitious circumstances; but such a degree of vision is often regained, as not only restores the patient to life and usefulness, but signally exemplifies the resources of surgery.

The numerous operations for artificial pupil which have been at different times invented, may all be referred to three principal classes;—coretomy, or the simple incision of the iris; corectomy, or the excision of a portion of that membrane; and coredialysis, or partial separation from its ciliary attachment.

Coretomy.—This operation appears to have been first introduced by Cheselden; but, though successfully performed by him in several instances, it has not equalled the expectations which others had been thereby induced to entertain of its general utility. It is predicated upon the contractility of the radiated fibres of the iris, and where this property has been destroyed by inaction from long-continued closure of the pupil, interstitial deposition, or other effects of inflammation, no separation will follow its division. It is, therefore, not improbable that disappointment may have arisen from inattention to this circumstance, and the consequent indiscriminate performance of the operation in all states of that membrane. It should not be adopted where either of the above-mentioned conditions are present, or when there is any considerable departure from the healthy structure of the

iris; but in recent cases of closure of the pupil, prolapsus iridis, and in partial synechia anterior—the greater portion of the cornea being transparent, and the iris apparently stretched between the points of attachment and adhesion,—it is often preferable to any other mode. It is performed by introducing the iris-knife through the sclerotica about a line from its junction with the cornea, as in the operation for the removal of cataract by solution or depression, and piercing the iris at the distance of one-third of its semi-diameter from its temporal margin; the point of the instrument is then carried across the anterior chamber to the nasal edge of the cornea, when it should be partially withdrawn, with gentle pressure upon the iris, and, if the division be not accomplished, again passed forward, and the manœuvre repeated, until, fibre after fibre having been divided, an opening is formed one-third or one-half of the diameter of the membrane. The chief difficulty arises from the facility with which the iris yields before the pressure necessary to divide its texture; a circumstance which requires great caution on the part of the operator, to avoid separating it from its ciliary attachments. The knife used for this purpose should be about two-thirds of an inch in length, less than the tenth of an inch in breadth, with a straight back and sharp point, the edge being curved like a scalpel, and extending from the extremity towards the handle, for the space of about three lines.

When the case is complicated with cataract, the capsule and lens may be divided at the same time. Injury to this body is unavoidable in the operation, and it should, therefore, be so broken up in all cases, as to ensure its solution in the aqueous humour. If necessary,

to promote the absorption, the needle may be introduced at a subsequent period, and the fragments still further comminuted.

Two very excellent pupils were formed by the author not long since, at the Wills Hospital, in the manner just described. Both patients were blind from the explosion of gunpowder in blasting rocks; in one a triangular segment of the iris, at its inner and upper part, had been driven inwards, and the inflammation which followed, had terminated in obliteration of the pupil, and the copious effusion of lymph into the posterior chamber; in the other, the lens was opaque, and the contracted pupil, obstructed by lymphatic deposition, adhered at its lower margin to the cornea; producing, at the point of union, a slight opacity of that membrane. In the former case, the iris was divided in its transverse diameter, the fibres retracted, and the opening, which was situated chiefly on the temporal side, remained permanent; in the latter, the division was necessarily made considerably below the median line:—the patients in both instances recovered a very useful degree of vision.

The operation by incision may also be performed through the cornea, and this method, originally proposed by Janin, was subsequently modified by Maunoir, and very successfully employed both by that gentleman and by Scarpa. A puncture having been previously made in the cornea, either by the knife used in the extraction of cataract, or by the cornea scalpel,—an instrument of the same form, but double the size of that just described—involving about one-fourth of its circumference, the operator introduces a pair of fine scissors, perforates the centre of the iris with the pointed blade, and passes it along the posterior surface until the other is arrested by

the cornea at its junction with the sclerotica; the membrane is then divided in its transverse diameter, and another incision is immediately made, diverging from the first, so as to include a triangular portion, the apex of which terminates in the centre of the iris. The part thus insulated retracts in the direction of its base, and leaves an opening which admits sufficient light for the purposes of vision. In cases where the iris is tense and unaltered in texture, a single incision only is necessary, and may either be made in the centre of the membrane, or through the radiated fibres near their junction with the orbicular. The operation of Maunoir is alike applicable to closure of the pupil, and central opacity of the cornea; and possesses an advantage over some others, in that the newly formed aperture is not situated directly opposite the incision in the cornea. The blades of the scissors used in this operation are about three-fourths of an inch in length, slightly inclined towards the handles, and their united thickness does not exceed the size of an ordinary probe. The superior blade terminates in a slight button or enlargement, the inferior, which is to penetrate the iris, is sharp-pointed, and about the twentieth of an inch shorter than the other.

A bandage should be applied to the eye after the operation, the chamber darkened, and such measures adopted as will most effectually prevent the accession of inflammation.

Corectomia.—The inapplicability of the operation by incision to many cases requiring the formation of an artificial pupil, and the numerous failures—partly owing to the circumstance already mentioned, of not insisting, as an essential condition, upon a healthy state of the iris—which followed its performance, have led to the

adoption of other and more certain methods. Reichenbach, in 1767, proposed the excision of a portion of the iris; and this operation, first practised by Wenzel, senior, in 1780, and subsequently modified by Beer, in 1805, is generally performed by English and American surgeons, in the manner recommended by Mr. Gibson.

An incision, three or four lines in length, is made in the cornea, immediately in front of its junction with the sclerotica; the aqueous humour escapes, and is usually followed by a slight protrusion of the iris, which should be increased by gentle pressure on the inner and upper part of the globe, until the prolapsed portion equals in size the head of a pin, when it must be excised by the curved scissors; including in the part removed, a portion of the pupillary margin. It may happen, however, that the iris does not readily protrude, in which case the edges of the wound should be slightly separated by any convenient instrument, and pressure simultaneously made upon the eye; or a small hook may be introduced, the membrane drawn forward, and the excision performed as before; care being taken not to include too large a segment, otherwise the aperture will exceed the required dimensions. If adhesions have formed, as in synechia anterior, they may be separated with the point of the knife employed to puncture the cornea; but when they are extensive, it will be better to perform a previous operation for that purpose.

When the pupil is unadherent, Mr. Tyrrell punctures the cornea at its inferior and outer portion, with a broad flat needle, and, introducing a fine, blunt hook, draws a part of its margin through the opening, and excises it with the scissors,—an operation essentially the same as that practised by Beer.

In some cases of synechia anterior, the division, or more properly, the abscission of the adhering portion, by means of the iris-knife introduced through the cornea, will enable the pupil to regain its natural position, and, being thus removed from behind the opacity, to admit light in quantity sufficient for vision; if the adhesion be merely owing to lymphatic exudation, without ulceration or prolapsus, a section of the cornea may be made, as in Mr. Gibson's operation, and the extrication effected by means of a small flat probe. In cases of central opacity, the pupillary margin being unadherent, Professor Himly was accustomed to prolapse a portion of the iris, through a small opening in the cornea, immediately at its circumference, without subsequent excision of the membrane; and this more simple operation has, on several occasions, been successfully practised at the Wills Hospital, by my colleague, Dr. Hays.

Lateral excision, as above described, is very frequently performed for the formation of an artificial opening, and is especially adapted to cases of central opacity of the cornea, partial synechia anterior, and closure of the pupil, the lens and capsule still preserving their transparency. Demours relates an instance in which one-fifth only of the cornea was transparent, the iris throughout adherent to the remainder of that membrane, the aqueous humour absent, and the anterior chamber obliterated. The operation was performed by opening the cornea, and excising a portion of the iris; the patient twenty years afterwards, was able to read very well with the aid of a convex lens, and to distinguish a person at the distance of fifty paces. Several years ago, the author operated, with equal success, in a case where the morbid changes were scarcely less considerable. •

Mr. Wenzel's method, already alluded to, but now never practised, consisted in making an incision in the cornea, as in the operation for the extraction of cataract, the knife being simultaneously passed through the iris, so as to form a flap of smaller dimensions in that membrane; this was afterwards excised by the scissors, or two incisions were made in the iris, including a triangular portion, as in Maunoir's operation, except that, in this instance, the base was reversed and corresponded to the division made by the knife.

Coredialysis.—The occasional partial separation of the iris from its ciliary connexions, by blows, surgical operations, &c., suggested about the same time to Scarpa and Schmidt, the idea of forming an artificial pupil at the circumference of that membrane. Simple separation, or iridodialysis, as this operation is termed, was all that was contemplated in the first instance; and is performed by introducing a curved cataract needle through the sclerotica at the external canthus, and carrying it, with its convexity forward, across the posterior chamber, till it reaches the upper and inner part of the iris, which it perforates as near as possible to its ciliary border; the separation being effected by pressing the point, thus entangled, in a direction downwards and outwards. The ciliary processes, which extend to about one-fourth of the semi-diameter of the iris, intercept, in some measure, the rays of light, and subsequent experience having, moreover, shown that the opening formed in this way, soon became nearly or quite obliterated, it was proposed by Langenbeck to draw the detached portion of the iris through a puncture in the cornea, and leave it there, to contract adhesions with the edges of the wound. Iridenceleisis, as the operation is denominated, is performed

in the following manner;—an incision, one and a half or two lines in length, parallel to the basis of the intended pupil, and therefore vertical if this is to be situated at the nasal or temporal margin of the cornea, having been made through that membrane, about its centre, or rather more than half of its diameter from the point of separation, a fine hook is introduced, by which the iris is engaged immediately at its ciliary border, detached from its connexions, and cautiously drawn out, until an opening of sufficient magnitude is produced. When from any cause,—the size of the puncture in the cornea, alteration of structure, adhesions, &c.,—strangulation of the iris between the edges of the incision cannot be thus effected, Assalini recommended the excision of the portion drawn out of the anterior chamber; and this compound operation, which is called *iridectomedialysis*, and is the most certain modification of *coredialysis*, is well adapted to those cases of central opacity, whether complicated with *synechia anterior* or otherwise, in which only a small segment of the cornea preserves its transparency.

The formation of an artificial pupil by separation of the iris from the ciliary ligament, as modified by the German surgeons just mentioned, is sometimes preferred to *corectomia* or lateral excision, in obstruction of the natural aperture by lymph, or adhesion to an opaque capsule; and notwithstanding the serious objections to which it is justly liable, such as the unfavourable situation of the opening, the injury which it inflicts upon the eye, &c., is a valuable resource in many cases, inasmuch as it partially restores vision where the other methods have either failed, or are inapplicable. A pupil of quite sufficient magnitude was made in this manner,

during the last summer, by the author, at the Wills Hospital, under circumstances almost desperate; the aperture continued permanent, and the patient would no doubt have enjoyed very good vision, but for the insensibility of the retina.

Blood is generally effused in considerable quantity, and more or less inflammation always occurs after these operations. A strict observance of the antiphlogistic regimen, with confinement to a dark room, should therefore be enjoined; and inflammation averted or arrested, by the prompt employment of the appropriate remedies.

DISEASES OF THE CRYSTALLINE AND CAPSULE.

CAPSULITIS.

INFLAMMATION of these parts is described with great minuteness of detail by the German writers, who even pretend to discriminate between the affection of the lens and either hemisphere of its membranous envelope. The symptoms, however, are generally so obscure, that the actual presence of the disease is seldom recognised, and for the most part, it is known only by its effect in destroying the transparency of the tissue in which it is seated. It is commonly associated with some degree of iritis, and, according to Walther, usually occurs about the middle period of life, and in persons of cachectic constitution. In this complicated form, capsulitis is accompanied with slight intolerance, and dimness of vision; the pupil is contracted, approaches more or less to an oval outline, its motions are sluggish and limited in extent, the iris loses its brilliancy, and a dark or reddish-brown tinge is perceptible around its interior circle. When the pupil is dilated by belladonna, red vessels may be observed running upon the capsule, and with the aid of a magnifier, a much greater degree of vascularity can be discovered. The minute arteries are arranged in a beautiful manner; forming a wreath composed of a series of vascular arches, from which vessels pass towards the centre of the membrane, where they

again ramify so as to constitute a plexus of similar character.

When the disease is more strongly developed, the vascularity is sometimes so considerable as to exhibit an uniform redness, and in such cases, the capsule occasionally presents a flocculent gray, or brownish appearance, from the deposition of lymph. The inflammation is tardy in its progress, the pain trivial and felt chiefly above the brow, objects appear as if seen through a fine gauze, and vision, impaired from the beginning, gradually becomes more indistinct and confused. Lenticular cataract, thickening and opacity of the capsule, or effusion within its cavity, may be enumerated among the consequences of capsulitis.

As might be anticipated, the inflammation of a part thus isolated in its relations, is little influenced by any remedies we may employ; when it is detected sufficiently early, the local abstraction of blood, mercury, counter-irritation, belladonna, &c., constitute the appropriate treatment; it rarely happens, however, that they are followed by any beneficial result, and the resources of art are principally displayed in the removal of its ordinary consequences,—opacity of the capsule and lens.

The capsule is occasionally converted into a bony or calcareous shell, and the lens has also been known to undergo a similar degeneration; these phenomena, however, are so rare as to demand only a passing notice.

CATARACT.

An opaque condition either of the crystalline or its capsule, is denominated cataract. When the opacity is

seated in the lens, it is called lenticular cataract ; capsular, when the membrane only is opaque ; and capsulo-lenticular, when both are combined. The several varieties of these principal divisions are still further distinguished by names descriptive of their appearance, or some other circumstance connected with them.

The principal symptom in the incipient stage, is indistinctness of vision, which gradually increases from a mist, or cloud, enveloping every object, to a state of almost total blindness. On examination, the lens is observed to be more or less opaque, and the opacity augments in proportion as the sight is impaired. It is most considerable in the centre ; and when fully formed, presents a densely white, gray, or amber hue, which is sometimes strongly contrasted with an appearance as of a black ring encircling its circumference. This phenomenon is caused by the shadow of the iris, and varies in breadth and distinctness according to the distance and colour of the cataract. Vision is always more perfect when the pupil is dilated, as in the shade, or at the approach of evening ; it often continues laterally some time after objects cease to be discernible in front, and the patient is generally able, even in the worst cases, to distinguish light from darkness. When the disease is uncomplicated with any other affection, and the size of the lens does not interpose a mechanical obstacle, the iris preserves its activity unimpaired, contracting or dilating according to the intensity of the light. The opacity is generally slow in its progress, requiring months, and sometimes years, for its full development ; instances, however, are occasionally met with, in which it is formed in a much shorter period, and this always happens where it originates in local

injury. When it occurs in one eye as a consequence of any internal or constitutional cause, the other usually becomes affected soon afterwards ; but this is rarely the case when it is produced by extrinsic violence.

Cataracts vary in consistence from a state of comparative hardness, to entire fluidity. Hard lenticular cataract is seen principally in advanced life, and may be recognised by its yellowish-brown, or amber tint, gradually fading into gray towards the circumference. The opacity commences in the centre of the lens, which is rather smaller than natural, and is situated at some distance from the pupil, leaving the iris free and unimpeded in its action ; the annular appearance caused by the shadow of the uvea is quite perceptible ; and in the dusk of evening, or when the pupil is dilated by *belladonna*, the patient can discern objects pretty distinctly. The soft or fluid cataract is large, prominent, and more completely fills the pupil, being either in actual contact with, or close proximity to, the iris. It involves in equal degree the entire lens, is the form in which cataract usually appears before the middle period of life, and is distinguished by its dull-gray, bluish-white, or milky colour, which presents a striking contrast with the darker hue of the iris. No shadow is thrown upon the lens, as in the denser variety, and as the opacity is more uniform, no room is left for the transmission of rays through its circumference,—vision, under such circumstances, being entirely lost. In the more fluid species, the opacity is of a grayish or cream-colour, and small dots, streaks, or *nebulæ* are sometimes observed, which vary their shape and position with the motions of the globe. It is difficult, however, notwithstanding these general distinctions, to form, in all cases, an accurate

judgment in the premises, and there are, probably, few surgeons of candour and experience, who would hesitate to acknowledge the occasional failure of their diagnosis. The age of the cataract itself has no influence upon its consistence; those of long standing, being often soft or fluid, and vice versa. All the varieties of lenticular cataract commence with dimness of vision, and inability to distinguish objects, unless viewed laterally, or brought close to the eye; their outline first becomes confused, and, the cloudiness increasing as the disease advances, the patient finally becomes, in many cases, merely sensible of the impression of a strong light.

In anterior capsular cataract, the consequence usually of inflammation, the opacity is convex, and exhibits a glistening white, or pearl colour; it is situated nearly on a level with the pupil, the motions of which it sometimes impedes, and, instead of being uniformly diffused, is striated, speckled, or otherwise variegated. It begins at different parts of the capsule, not unfrequently towards its circumference; vision is less impaired than in the lenticular variety, and the dark ring encircling its periphery is almost entirely wanting.

The posterior hemisphere of the capsule is much thinner than the anterior, and less liable to lose its transparency. When it does become opaque,—an occurrence which rarely happens while the lens preserves its clearness—the opacity is concave, radiated, and deeply-seated; presenting, instead of the shining white which characterizes the affection of the anterior portion, a dull yellowish appearance. It increases slowly, and so long as it is strictly confined to the capsule, the impairment of vision is less than in any other form.

When the capsule is generally opaque, the lens is

always involved, and this complication usually exhibits the same pearly and striated aspect which has just been mentioned, as distinctive of anterior capsular cataract. The duller and more equable opacity of the crystalline may sometimes be perceived through the interstices of the striæ; the patient retains little sensibility to light, and in early life the capsule, which is often thickened, is occasionally so much distended by the enlarged lens as to press forward the iris, and encroach upon the cavity of the anterior chamber. Under such circumstances, the pupil is immovable, and the dark shadow entirely wanting. At a more advanced age, the consistence of the lens is greater; it does not lie so closely in contact with the iris, the pupil is somewhat dilated, and its mobility unimpaired, but the annular appearance is rarely very distinct. The opacity is sometimes partial, and confined to the centre, the remainder of the lens preserving its transparency; and this condition, which occurs not unfrequently as a congenital affection, may continue without increase through life.

The lens is sometimes absorbed, and the capsule alone remains, obstructing the pupil in various degrees, according to the density of the opacity, and the extent of its connexions with the ciliary body. It is of a light gray or chalk-colour, presents a flattened, and sometimes a corrugated disk, and is often adherent at one or more points to the pupillary margin of the iris. It may either arise from spontaneous absorption, as in children, in whom it is frequently connected with an oscillatory motion of the globe, or may be, as in adults, the consequence of injury inflicted accidentally, or in the performance of surgical operations.

Differences, more or less apparent, distinguish also the

other forms of cataract ; but in a work like the present, allusion can only be made to a few of the peculiarities which mark some of the chief divisions.

Diagnosis.—The disease not only occurs in gouty, rheumatic, and other unhealthy conditions of the system, but is frequently complicated with various local affections, such as amaurosis, synechia posterior, closure of the pupil, glaucoma, a dissolved condition of the vitreous humour, and other consequences of internal inflammation. For some of these—amaurosis and glaucoma, especially,—it is liable to be mistaken during its formative period, and the error is the more unfortunate, inasmuch as it prevents the adoption of the appropriate treatment for those diseases, at a period when alone it can be successfully employed. In amaurosis the opacity, or rather the paleness, is more deeply-seated, and has a turbid or horny appearance ; it bears no proportion to the decline of vision, the patient being nearly or quite blind, though the obscuration is hardly perceptible. The pupil is generally dilated, not unfrequently somewhat irregular, and the iris scarcely, if at all movable. It is more commonly attended by an appearance as of *muscæ volitantes* or of dark spots before the eye, than of a mist or gauze which accompanies the formation of cataract. In the latter affection, the opacity being greatest in the centre of the lens, vision is always more distinct when objects are viewed laterally, or when the pupil is dilated, either artificially or on the approach of evening ; the patient sees better when standing with his back to the light, and derives advantage from the use of a concave glass, which, by diverging the rays, causes them to fall upon the circumference of the crystalline ; while in

amaurosis, a brilliant illumination is usually required, there is no difference in perceiving objects however situated, and no improvement from the use of spectacles;—the temporary increase or diminution of sight depending upon causes which excite or depress the system, and not upon the state of the pupil. Amaurosis, moreover, is often accompanied by other symptoms—pain over the brow, vertigo, headache, scintillations, strabismus, ptosis, &c.—which are seldom observed in conjunction with cataract. It is only, however, in the incipient stage of these diseases, or where they exist in combination, that there can be any difficulty in establishing the diagnosis; for when fully developed, the characteristics of each are sufficiently apparent. In glaucoma, also, the opacity is more deeply-seated, has a concave appearance, is more uniformly and extensively diffused, and exhibits a dull, dingy green, or dirty yellowish discoloration. The individual can see better in a strong light, and vision, as in amaurosis, bears no correspondence with the degree of opacity, being often nearly destroyed, though the cloudiness of the pupil is scarcely appreciable. There is usually more or less pain and uneasiness, the globe is tense and firm to the touch, its vessels frequently varicose, and its whole aspect often unhealthy. In all these cases the diagnosis may be greatly assisted by the artificial dilatation of the pupil, and by concentrating upon it the rays of light through the medium of a double convex lens.

The application to the eye of the catoptric phenomena produced by the reflection of the rays of light from convex and concave surfaces, first made by M. Sanson, has lately furnished a certain and invaluable diagnostic sign

in these affections. In a darkened room,—the pupil having been previously dilated to facilitate observation—when a lighted candle is passed before an organ of which the tissues are perfectly diaphanous, three images are perceptible to the observer seated in front, all situated behind the cornea, and reflected respectively from that membrane, and the anterior, and posterior capsule of the lens. The first and third, reflected from convex surfaces, are both *upright*, and move in the same direction with the candle; the former being small and distinct, the latter larger, paler, and less plainly circumscribed. The second image, reflected from the concave surface of the posterior hemisphere of the capsule, is the smallest of the three, bright, well-defined, *inverted*, situated between the others, and moving in a direction contrary to that of the candle. They are all visible in a healthy eye, and in uncomplicated cases of amaurosis also; but when the transparency of the capsule or lens is impaired, as in incipient cataract, the inverted and posterior images lose their distinctness, and, the former especially, fading with the increasing opacity, soon disappear altogether. After the lens and capsule have been removed from the axis of vision, one image only, that reflected from the cornea, is, of course, present.

Causes.—In common with other parts of the body, the crystalline undergoes alterations as life advances, which render it less fitted for the proper performance of its functions; its convexity diminishes, and its colourless transparency gradually verges to a yellow or amber tint. This deviation alone may be sufficient in some cases to impair vision; but the opacity which constitutes cataract is more commonly owing, when it occurs under such circumstances, to defective nutrition from the changes

which are going on in the vascular or lymphatic system, and are earliest manifested in the delicate organization of the lens and its capsule. Falls, blows, and wounds, which rupture the ciliary attachments of the capsule, or, by destroying its continuity, subject the lens to the action of the aqueous humour, are ordinary causes of cataract; and it has been known to happen also, as a consequence of fever, and other causes which derange the circulation of the crystalline. In many instances the opacity, both in its origin and progress, is wholly unconnected with inflammation or congestion; but that the reverse, also, is not uncommon, is evident from the morbid alterations—thickening of the capsule, adhesions, &c.,—with which it is frequently complicated, and the circumstances which are said to engender a predisposition to the complaint; thus, it arises from exposure to intense light and heat, determination to the head, and general plethora, whether induced by habitual indulgence in the pleasures of the table, the suppression of customary evacuations, &c., &c. In some cases its formation is attended with aversion to light, a sense of heat, and other indications of undue excitement. Petit states that of three hundred cases of cataract which came under his observation, two-thirds occurred in persons who had been accustomed to much exercise of their eyes in a strong light. The capsule, thickened and otherwise changed by inflammation, loses its elasticity, and, though divided by the needle, often remains obstructing the pupil, after the lens has been removed by absorption. The disease is very frequently congenital, and numerous examples are also recorded of its hereditary transmission.

Treatment.—The expectation of arresting the progress

of cataract, or, after opacity has taken place, of restoring the pellucidness of the tissues by medical treatment, having been, in this country, at least, altogether abandoned, the only remedy consists in the removal of the opaque body from the axis of vision, by means of a surgical operation.

Previously, however, to resorting to such a measure, there are several preliminary questions which require consideration, and of these, one of the most important is the frequent complication with amaurosis and other affections; which often exists to such a degree as to render the operation entirely nugatory. The surgeon should therefore be extremely guarded in his prognosis, for the state of the parts posterior to the opaque crystalline cannot be accurately determined, inflammation will sometimes frustrate his exertions, and the disappointment is always proportionate to the importance of the object, and the strength of previous expectation. The patient should be exempt from the actual presence of any constitutional disorder, such as gout, rheumatism, and scrofula, and also from any disease of the eyelids which might exert an injurious influence. No operation should be undertaken during the existence of ophthalmia of any kind; and prudence will dictate the propriety of correcting any gastric derangement, and of adopting preparatory measures to avert or moderate inflammation. A restricted diet, saline laxatives, and the neutral mixture with the nitrate of potash, may be advantageously prescribed with this view for a few days previously; and, if there be any undue fulness of the vascular system, venesection will also be indicated. Mild and settled weather should be chosen for its performance, and when the surgeon has the power of selection, he will therefore

prefer, with the exception of midsummer, the period intervening between March and November. It is, in general, improper to interfere while there is any degree of useful vision, and it is also deemed inexpedient to do so when one eye only is affected. In the case last mentioned, however, where the removal of the cataract is particularly desirable on account of the deformity which it occasions, there can be no objection to the performance of an operation, except the confusion which may arise from eyes of different powers of refraction, requiring glasses for its correction. It has likewise been thought, that if, under such circumstances, symptoms are present indicative of its incipient formation in the other organ, the further progress of the disease might be thereby arrested, but this is not a very probable consequence. It is customary to operate on one eye only at a time, and this caution is especially applicable to cases of extraction.

The operation is performed in three different modes,—extraction, depression, and division or absorption,—each of which possesses advantages which may render it eligible under certain circumstances.

In this country the operation by *absorption* is generally preferred; it is well adapted to the removal of soft or fluid cataract, the usual form in which the disease appears in early or middle life; requires little manual dexterity; is attended with less danger to the eye than either of the others; and may be employed in a multitude of cases where, from complications and other causes, extraction is inapplicable. The principle on which it is founded, is the removal of the lens by the agency of the aqueous humour, admitted through an opening in the capsule. The pupil having been previously dilated by

the application of belladonna to the brow, and the patient placed upon a table in a supine position, supported by pillows, an assistant retracts one of the lids, while the surgeon takes charge of the other, and introduces a sharp-edged needle,—either straight or very slightly curved, and about eight or ten lines long in its shaft,—through the sclerotica, parallel with its fibres, a little above its transverse diameter, and not more than a line from the cornea. The point of the instrument having been directed towards the centre of the eye while piercing the sclerotica, should be brought forward as soon as it has fairly penetrated that membrane, by depressing the handle towards the temple, and after being rotated one-fourth of a revolution, so as to bring its flat surface upwards, carried between the fringed extremity of the ciliary processes and the circumference of the capsule, across the posterior chamber, a little beyond the middle of the pupil. If the needle have penetrated the eye too deeply in the first instance, it should be partially withdrawn, else it would be entangled in the substance of the lens; and, while endeavouring to avoid this accident on the one hand, some care is necessary not to injure the iris on the other. When the instrument, thus dexterously guided through the narrow passage, has fairly reached the centre of the pupil, its cutting edge is turned towards the opacity, and the capsule with the crystalline gently divided into several pieces. In performing this part of the operation, it is advisable to raise the needle repeatedly clear of the cataract, and re-center it again in a different part, but not to raise the point too near its superior margin, otherwise it would be liable to be dislocated, and revolve upon its

axis;—a circumstance, however, from which no great mischief would arise, except, perhaps, a greater tendency to inflammation from the pressure upon the iris. If the lens happen to be fluid, it escapes immediately on opening the capsule, and is diffused through the aqueous humour; and when it is of firmer consistence, small fragments are often observed floating through the chambers.

In those instances where the cataract is soft or fluid, a single operation is sufficient for its removal; but under other circumstances it is often necessary to repeat it after an interval of six or eight weeks. On these subsequent occasions, the crystalline should be more completely comminuted, and the fragments passed into the anterior chamber, where absorption is supposed to take place more rapidly;—care being taken to avoid, if possible, the posterior hemisphere of the capsule.

The mode of operation just described, is that usually adopted at the Wills Hospital both by the author and his colleagues, and has been followed by a remarkable degree of success; the consequence, probably, of the great attention which is given, both in the preparatory and subsequent treatment, to the prevention of inflammation.

After the operation, the eye should be lightly covered with a fold of linen confined by a bandage, the patient put to bed in a darkened apartment, with his head and shoulders elevated, the dilatation of the pupil preserved by means of belladonna, as well to anticipate adhesion, as to withdraw its margin from any detached portions of the lens which might occasion irritation and sickness, a rigid diet enjoined, and the earliest symptoms of iritis

inflammation promptly suppressed by the application of leeches to the temples, saline purgatives, the alterative exhibition of mercury, &c., &c.

The removal of the lens, thus become a foreign body, is effected through the agency of the absorbents; but the process of disintegration either does not commence, or makes very little progress during the continuance of the irritation which, in a greater or less degree, follows the injury necessarily inflicted by the operation.

Keratonyxis, or the introduction of the needle through the cornea near its margin, is also frequently practised by some surgeons; and, as it is easily performed, occasions little pain, and is fully adequate to the cure of the disease, is particularly applicable to cataract as it occurs in childhood; in very early infancy the thickness of the cornea, and the consequent proximity of the iris, may perhaps constitute valid objections to its employment. Less injury is thus inflicted upon the organ, and keratonyxis is therefore often resorted to on the first occasion in adults; but the surgeon has not such entire command over the needle, as when it is introduced through the sclerotica, and experiences consequently more difficulty in breaking up the lens. Where this mode of operation is preferred, it will be proper to limit the action of the instrument to the laceration of the capsule with as much of the lens as can be effected without displacement, and after the lapse of five or six weeks, to introduce it through the sclerotica, and complete the fragmentary division of the crystalline.

Where it is desirable to avoid the delay attendant upon the slow process of absorption, or when the irritation caused by the broken fragments of the lens, gives rise to chronic inflammation of the iris, it has been recom-

mended, two or three weeks after the use of the needle, to puncture the cornea with the knife, near its temporal margin, and remove the cataract, softened by the contact of the aqueous humour, with the aid of the curette. This mode of operating is extensively practised by Mr. Gibson at the Manchester Infirmary, and is adopted, also, by Mr. Travers, who dispenses, however, in the case of soft or caseous cataract, with the previous employment of the needle.

The operation for congenital cataract differs in no very material respect from that which has just been described. It is important that the obstruction should be removed without unnecessary delay, as the sensibility of the retina is weakened by long disuse, and the patient, moreover, early loses his control over the muscles of the eye; perhaps the age of six or eight months, before much irritation is ordinarily produced by dentition, may be assumed as the most eligible period:—many surgeons, however, prefer operating during the second year. As the lens in these cases possesses comparatively little consistence, its fragments are less liable to excite irritation, and may therefore be at once brought forward into the anterior chamber.

An opaque capsule frequently remains after the absorption of the crystalline, whether this occurs spontaneously or otherwise, obstructing the pupil, and requiring an operation for its removal. Congenital cataract often exists in this form, the lens having been either partially or entirely absorbed. As the capsule thus changed by disease, is, though divided, incapable either of rolling upon itself, or of being acted upon by the absorbents, the best operation, under these circumstances, is extraction

through a small incision in the cornea, by means of an Anelien probe, or a piece of fine silver wire, bent into the form of a small hook. An attempt is sometimes made by the needle introduced through the sclerotica, to detach the capsule from its ciliary connexions, and depress it below the level of the pupil; but this manœuvre is rarely successful, for the membrane, having less specific gravity than the surrounding fluid, constantly tends to resume its former position.

Depression.—Depression of the crystalline into the vitreous humour, below the axis of vision, is another mode resorted to for the removal of cataract, and like the operation by absorption, has the advantage of being easily performed. The pupil having been previously dilated by belladonna, and the patient placed in the posture already described, the needle is introduced through the sclerotica as before, and carried onward through the posterior chamber, until the point is just concealed behind the superior and nasal portion of the pupillary margin; the instrument is then turned upon its axis, so that its concavity is applied to the upper border of the lens, and pressed upon that body in such manner, as gradually to remove it, in a direction obliquely downwards and outwards, till it is no longer visible through the pupil; which will have been accomplished, when the handle of the instrument is brought into a direction parallel with the transverse diameter of the eye. The needle being held for a moment in contact with the lens, the more certainly to retain it in its new situation until the vitreous humour closes over it, is then to be brought into the anterior chamber, and gently moved around, so as freely to lacerate the capsule, if it have not previously

been ruptured, otherwise it may be withdrawn immediately. When this operation is properly performed, the crystalline and capsule are depressed together, or the lens alone escapes through a fissure in the posterior hemisphere of its envelope; but it happens also, not unfrequently, that the cataract, preserving its relations with the vitreous humour, merely revolves with that body, detaching it from its connexions with the ciliary processes, rupturing the minute vessels by which it is nourished, and being, moreover, extremely liable to resume its position when the depressing force is discontinued. To obviate this, Mr. Watson directs a breach to be made, as a preliminary measure, in the posterior portion of the capsule and in the vitreous humour, for the escape and reception of the lens; the point of the needle is then to be carried over its upper edge, the anterior hemisphere lacerated, and the crystalline depressed below the axis of vision.

Reclination is merely a modification of this operation, and is preferred by many surgeons, inasmuch as the lens thus depressed, is less liable to injure the retina, or to reappear behind the pupil. The needle is introduced as before, but instead of being elevated to the summit of the lens, is merely raised above its transverse diameter; the operation is completed by bringing the handle of the instrument in an oblique direction forward, and so displacing the crystalline, that its superior margin is turned backwards into the vitreous humour; its anterior surface looking upwards, and being on a level with the inferior edge of the pupil.

In false cataract caused by lymphatic deposition, an attempt may be made to destroy its adhesions with the iris, and afterwards recline or depress the lens; or, if the

pupil can be sufficiently dilated, it may be more certainly removed by extraction.

The operation of depression has been superseded in a great measure by that of absorption, which has been found much more extensively applicable than was anticipated at the period of its introduction. It is still, however, not unfrequently employed, and particularly in the hard amber-coloured cataract of advanced life, which resists the action of the needle, and does not readily dissolve in the aqueous humour. The chief dangers to be apprehended from it, are chronic inflammation, amaurosis from pressure upon the retina, and disorganization of the vitreous humour;—evils which are certainly of sufficient magnitude to deter from its selection in ordinary cases. The depressed lens is, moreover, liable to reappear behind the pupil after its displacement, and this occurrence is often rather desirable than otherwise, as its ascension not only relieves the retina, when it has been imprudently brought in contact with that membrane, but places it in circumstances to be more rapidly absorbed. It would seem, however, that the objections to depression, serious as they undoubtedly are, have been exaggerated by the exclusive advocates of extraction, since a comparison of the results afforded by the two methods, is by no means so unfavourable to it as might be anticipated. The lens depressed without its capsule, is subjected in its integrity to the action of the surrounding fluid, and is sometimes removed when its consistence has been deemed such as to render absorption impracticable.

In some instances, the two operations of depression and absorption may be performed on different eyes in the same individual. This was done in the case to

which allusion is made on page 45. An amber-coloured cataract, of eight years' duration, being too hard for division, was depressed; while a traumatic opacity of the other crystalline, the result of a blow recently inflicted, was divided by the needle, and removed through the agency of the aqueous humour. The depressed lens, which found its way into the anterior chamber about a year after the operation, was reduced at that time to about one-third of its natural size.

Extraction.—Though much has been justly said in favour of the operation by extraction, there are reasons which will ever prevent it from being practised by the great body of the Profession. It is comparatively complicated and difficult, requiring more than ordinary resolution and steadiness on the part of the patient,—circumstances which restrict its employment to adults,—and greater experience and manual dexterity than can be expected from the generality of surgeons, who have few opportunities either of witnessing or of performing such operations. These objections, however, are rather so many reasons why persons should not undertake that which they are not qualified to perform, than arguments against the operation itself. Neither would the accidents which accompany, or the dangers which follow extraction, be entitled to more weight, if it were really the surest means of restoring vision, for it would, on that supposition, be the duty of the patient to incur the risks attendant upon it. But the fact that the object can generally be better and more safely attained by a different method, one too, which almost any competent surgeon is capable of performing, has necessarily caused it to fall into disuse; though cases still occur in which it is entitled to preference over the

other methods described. It is adapted to hard lenticular, or thickened capsular cataract—conditions which long resist, or altogether defy the action of the absorbents—and demands, as conditions favourable to its success, a prominent eye, a large anterior chamber, a cornea of ample dimensions, and a due degree of constitutional or reparative power. The pupil having been previously dilated by belladonna, the patient so placed in a recumbent, or, if the operator prefer, a sitting posture, that the light may fall upon the eye from a convenient direction, and the upper eyelid being properly elevated by an assistant, the surgeon, while depressing the lower lid, steadies the globe with the index and middle fingers, and introduces the point of the knife—holding the instrument with the fingers contracted, so as to admit of its propulsion without requiring for that purpose the movement of the whole hand—perpendicularly to the cornea, about one-third of a line from its circumference, and a little above its transverse diameter. Having fairly penetrated the membrane, he depresses the handle towards the temple, and carries the blade horizontally across the anterior chamber, until it reaches the corresponding point on the opposite side, through which it is to be steadily passed, and the section of the cornea completed by the progressive motion of the instrument. Failure arises in most cases from the smallness of the incision; but this accident will be prevented by attention to the directions given. This stage of the operation being finished, the lids are closed for a brief period, in order to preserve the dilatation of the pupil, and quiet the irritability of the organ. The next object is to open the anterior hemisphere of the capsule; to accomplish this, the superior palpebra is raised as before, and the sur-

geon depresses the lower lid, pressing it gently against the globe, to favour the advancement of the cataract, and also that he may the more readily introduce the sharp extremity of the curette through the incision in the cornea. The capsule having been divided by repeated crucial incisions with this instrument, it is carefully withdrawn, and the palpebræ again allowed to close for a few minutes. If its envelope have been sufficiently lacerated, the crystalline sometimes follows immediately, but when this does not happen, the eye should be again uncovered, and the pressure renewed through the medium of the lower lid, until the lens is observed to enter the pupil, from which moment to the complete exit of the cataract, it must be gradually diminished. If the crystalline should be arrested between the edges of the cornea, in consequence of too small an incision in that membrane, its escape may be facilitated by means of the curette; and in this part of the operation, the utmost caution is required to prevent the loss of the vitreous humour. The opaque lens having been removed, the patient is requested to close his eyes as if about to sleep, and the operator having ascertained that the edges of the incision are in accurate adjustment, the lids should be covered with a fold of dry linen, confined by a light bandage, and left undisturbed for two or three days. Very considerable inflammation generally follows the operation, and must be subdued by the prompt employment of the appropriate remedies. The patient should be confined to bed in a darkened room for the first week, and carefully watched by an experienced assistant.

When the lens has been absorbed, and the opaque and thickened capsule alone remains, a much smaller inci-

sion may be made in the cornea, a small hook or forceps introduced, and the membrane, in general, easily removed.

The operation by extraction, as already stated, is adapted to those cases in which the lens is so much indurated as to be impenetrable by the needle, and is generally the only one that can be successfully performed, when, after the absorption of the crystalline spontaneously or otherwise, a tough, thickened, inelastic capsule is left obstructing the pupil; particularly if, its ciliary connexions being destroyed, the membrane floats loosely in the eye, and presents no resistance to the instrument. Under the circumstances first mentioned, depression or reclination is sometimes preferred, and is perhaps employed still more frequently than it would otherwise be, from the fact, that the consistence of the lens cannot always be previously ascertained, and the surgeon, contemplating absorption, but finding the opaque body too hard for that process, is induced to couch or recline, rather than subject the patient to another operation. This latter mode may be primarily adopted as the only practicable resort, in hard lenticular cataract, where the conditions which have been enumerated as favourable to extraction do not exist, and though the event often disappoints the expectations excited by the immediate restoration of vision, appears, as before stated, to have been successful in a greater degree than might be anticipated.

Of three hundred and six cases of extraction at La Charité, the cures were to the failures in the proportion of two and a half to one, while of an equal number depressed by Dupuytren at the Hotel Dieu, they were more than five to one. Of seventy operations by ex-

traction, forty-three by displacement, and twenty-one by keratonyxis, performed at the institution last mentioned, between the years 1806 and 1810, the successful cases were respectively, nineteen, twenty-four, and seventeen. The native Hindoos practise a rude mode of depression, through a puncture previously made with a lancet, and of seventy-seven operations thus performed, the cures were as two and a half to one.

As in all the operations for the removal of cataract, inflammation is the principal consequence to be dreaded, the precautionary measures already recommended, cannot be too strongly enforced. The eye should be covered with a light bandage, the patient confined to a darkened chamber, a farinaceous diet strictly enjoined, and the accession of ophthalmia promptly met by general or local depletion, purgatives, the exhibition of mercury, &c., &c. An anodyne the following night is often useful in allaying excitement, and procuring sleep, and attention should likewise be directed to the maintenance of the dilatation of the pupil by the occasional application of belladonna to the brow.

The refractive power of the organ being necessarily diminished by the loss of the crystalline, it becomes necessary to supply the place of that body by artificial means, and glasses are usually required both for near and distant vision, with foci respectively of two and a half, and four and a half inches. They should never be employed while any degree of irritation is present, generally not within two months after the operation, and even then used for a while occasionally only.

DISEASES OF THE HYALOID MEMBRANE.

HYDROPHTHALMIA. HYALITIS.

A PRETERNATURAL developement of the cornea, with corresponding increase in the capacity of the anterior chamber, is occasionally observed, and constitutes a variety of hydrophthalmia, or dropsy of the eye. In a case of this kind recently seen by the author, the cornea was enlarged to more than twice its ordinary dimensions, with a proportionate augmentation of its convexity; its transparency was unimpaired, vision very defective, and the affection, as in most instances of this species of hypertrophy, was congenital. Juengkin mentions a Swedish family, seven brothers of which had congenital dropsy of the anterior chamber. When it arises from a redundancy of the aqueous humour in consequence of chronic inflammation of its secreting membrane, it is attended with a sense of fulness or tension in the eye, and augmentation of the anterior chamber, as well from the retrocession of the iris as the expansion of the cornea. The pupil is dilated, the pellucidness of the cornea more or less impaired, and the patient, near-sighted in the beginning, becomes, in the progress of the complaint, partially amaurotic.

The dropsical enlargement is sometimes confined more particularly to the posterior portion of the eyeball, and is owing to an increased exhalation from the hyaloid membrane, the consequence of morbid action, excited probably by some constitutional depravation, as

scrofula, syphilis, &c. The globe is enlarged in every direction, and this condition, properly denominated *hydrops oculi*, or general dropsy of the organ, is also called *buphthalmus*, from its resemblance to the eye of an ox. As the symptoms advance, the cornea becomes extended, flattened, and opaque; the iris motionless and prominent anteriorly; the sclerotica is attenuated by the distension, and the dark colour of the choroid is perceptible through its substance; vision is early destroyed; the pain, tensive and deeply seated, is not unfrequently accompanied with *hemicrania*; the vitreous humour is in a fluent condition from the destruction of the *septa hyaloidea*, and the eyeball, enlarged, tense, and immovable, protrudes between the lids, when it sometimes inflames and ulcerates, or rupture takes place, with partial evacuation of the humours, and relief of the symptoms.

Advantage may occasionally be derived from the local abstraction of blood, counter-irritation between the shoulders, aperients, diuretics, the alterative use of mercury, and such measures generally, as control vascular action, and produce a derivation from the head. More commonly, however, the disease continues to advance, and is the cause of much suffering from the distension of the investing membranes, the pressure of the globe upon the surrounding parts, the sympathetic irritation of the sound eye, and the repeated attacks of inflammation to which the organ is exposed. Under such circumstances the evacuation of the fluid by a puncture through the sclerotica, or a small incision in the lower part of the cornea, repeated according to circumstances, will be a palliative measure, and,—the curative means being meanwhile continued,—may occa-

sionally succeed in effecting a radical cure. In order to accomplish this, however, it is necessary, in most cases, to excise the apex of the cornea as in the operation for staphyloma.

Effusion between the choroid and retina has been already noticed as an occasional consequence of choroiditis, and produces effects varying according to the acuteness of the inflammatory action. When the accumulation of fluid takes place slowly, vision is gradually impaired, and the uneasiness is not very considerable; but under other circumstances, the pain is highly aggravated, and the sclerotica, distended by the internal pressure, projects in the form of one or more bluish tumours. The fluid acting also in the opposite direction, protrudes the retina towards the centre of the eye, where it may be seen through the pupil like a deep-seated opacity, which, without attention to the other symptoms, might possibly be mistaken for malignant disease of the nerve. Interference is unnecessary so long as little inconvenience is produced, but if otherwise, the projection, which consists partly of the varicose vessels of the choroid, may be punctured as above directed.

SYNCHISIS OCULI.

When the vascular excitement attendant upon the internal ophthalmiæ has subsided, the absorbents resume their former activity, and the secretory functions of the hyaloid membrane being sometimes weakened or annihilated, a diminution of volume is produced, to which the term synchisis has been applied. Under such circumstances the globe loses its tension, becomes flaccid,

and the iris, no longer equably supported, acquires an undulating or tremulous motion. The mobility of the pupil is nearly or quite destroyed, and vision is either greatly impaired, or lost altogether, according to the degree of disorganization. As the state of things now described is the sequel of some preceding disease which has subverted the healthy condition of the organ, it is beyond the reach of any surgical treatment, though invigorating measures, as tonics, a nourishing diet, &c., may be appropriately prescribed in the hope of arresting its further progress.

The tunica hyaloidea is a serous membrane, and consequently liable to the diseases which affect similar tissues in other parts of the body. Besides the state of dissolution, and the increase or diminution of its secretion, already mentioned, its septa are sometimes thickened and rendered opaque by inflammation, and instances are recorded in which they have even been found ossified. Its secretion also may be deranged from the same cause, and undergoes various changes in colour and consistence; to some of which allusion has already been made.

DISEASES OF THE GLOBE.

THOUGH obliged, for the sake of perspicuity, to describe the inflammation of the several tissues as so many separate and independent affections, we rarely find the lines of demarcation as strongly drawn in practice. Morbid action is seldom limited to the part in which it originates; the severer forms of conjunctivitis, sclerotitis, iritis, and choroiditis, tend constantly to implicate the other textures; and though the distinctive appellation is necessarily derived from the one primarily or most prominently involved, it should be borne in mind that it is often a compound lesion, characterized by the symptoms, variously modified and combined, which mark the affection of the individual tissues. When we consider the number and variety of the parts which are brought together in the eye, exhibiting an epitome of the whole frame, supplied in part by the same vessels and nerves, and concurring in the performance of one common function, it is surprising that complications do not exist to a still greater extent in the diseases of that organ.

OPHTHALMITIS.

In this formidable disease, which happily is not of very frequent occurrence, the inflammation attacks several of the tissues which enter into the composition of the eye, either simultaneously, or in such rapid succes-

sion, that it is quite impossible to determine the order in which they respectively become involved. The symptoms vary of course, according to the greater or less predominance of the affection of any particular texture, but the same general character may be recognised in every instance. The pain, owing to the unyielding nature of the investing membranes, is always severe,—acute and lancinating, or dull, aching, and throbbing,—extending to the parts around the orbit, accompanied with severe headache or hemicrania, and an agonizing feeling of distension; the sensibility to light is extreme, and there is an appearance as of luminous bodies darting before the eyes, indicating the extension of the inflammation to the retina. The pupil is contracted, the palpebræ spasmodically closed, and all motion of the organ exquisitely painful. The external redness is at first inconsiderable, and the pink-coloured vessels of the sclerotica may be observed beneath the conjunctiva, but they are soon concealed by the increasing vascularity of this membrane, which gradually acquires a deep scarlet colour, and forms a broad circular ring around the cornea, denominated chemosis.

As the disease advances, various morbid changes are perceptible in the internal parts; the pupil is contracted and immovable, the cornea becomes turbid and finally opaque; and in some instances, the globe, everting the lids, protrudes in the shape of a red fleshy mass, presenting a most unsightly spectacle. If the inflammation be not speedily arrested, suppuration ensues, the cornea ruptures, and the eyeball collapses from the evacuation of its contents.

Amaurosis, in a greater or less degree, is a common sequel of this disease, even in its mildest form, and in

more aggravated cases, the inflammation not unfrequently terminates in complete destruction of the organ of vision. Opacity, ulceration, and staphyloma of the cornea; disorganization of the iris; synechia anterior or posterior; permanent contraction of the pupil, or closure from effused lymph; cataract, &c., &c., are among its ordinary consequences.

The danger of ophthalmitis is chiefly to be estimated by the vehemence of the pain, the intolerance of light, constitutional disturbance, and the degree in which the transparent tissues and internal parts are affected. It is said to occur with greatest frequency in the right eye, and the severity of the symptoms sufficiently distinguishes it from inflammation of any individual texture.

Causes.—Gout, rheumatism, scrofula, and other morbid conditions of the system, may be enumerated among the predisposing causes; and in such cases, the disease will be more readily excited by external violence, neglected inflammation of any of the tissues, intense light, especially when combined with heat, and the usual agents which give rise to the ordinary forms of ophthalmia.

Treatment.—The sad consequences of ophthalmitis can only be averted by the most prompt and energetic measures in the very origin of the complaint; general and local depletion, active cathartics, nauseating doses of the tartrate of antimony, calomel, &c., should always be employed with a freedom proportionate to the urgency of the symptoms, and the importance of the diseased organ. Suppuration is, however, very liable to occur, notwithstanding the efforts to prevent it, and when it has taken place, it will be proper to relieve the sufferings of

the patient by evacuating the matter through a puncture in the cornea. In some instances a sufficient portion of the globe is preserved to form the basis of an artificial eye; but it happens also, not unfrequently, that the humours escape, and the membranes degenerate into a mere tubercle.

OPHTHALMITIS INTERNA.

Examples are not unfrequent in which the inflammation attacks chiefly the internal parts of the eye,—the retina, choroid and iris,—and presents a combination of the symptoms peculiar to the separate tissues; differing, however, in some of its features, according as one or the other is more prominently affected. It is attended with a dull, pulsative, and deeply seated pain, extending to the brow and upper part of the head, intolerance of light, frequent scintillations or flashes, and a sense of fulness or distension in the globe. The external vascularity is slight at first, but gradually increases, and before it becomes general, assumes a zonular arrangement around the cornea. Vision is greatly impaired from the commencement, and in aggravated cases is soon destroyed. The usual indications of iritis are present in a greater or less degree, the iris is discoloured, and the pupil dull and hazy from effused lymph, sometimes thrown out in such quantity as entirely to obstruct the aperture, which is generally contracted, and in the progress of the disease not unfrequently quite obliterated. The fibrous tissues eventually become involved, the cornea loses its transparency, and suppuration is not

an uncommon occurrence,—the matter making its appearance at the lower part of the anterior chamber, and constituting the phenomenon denominated hypopion.

There is a species of internal ophthalmia, usually observed in persons of arthritic, plethoric, and other unhealthy conditions of the system, which presents an assemblage of symptoms somewhat different from the foregoing; the pain, lachrymation, intolerance, &c., are equally or more severe,—the first, indeed, is often excruciating, and is described as burning or lacerating in its character,—but with these are associated many of the manifestations of choroiditis and hyalitis; indicating extensive disease of the internal tissues. The distended conjunctival vessels are sometimes so numerous as almost to conceal the livid redness of the sclerotica, which is most conspicuous around the anterior portion of that membrane; the cornea is dull or hazy; and the iris discoloured and motionless, with its inner circle reverted. The pupil is either contracted and irregular, or dilated, and approaching more or less to an oval form; it is sometimes cloudy from lymphatic deposition, and not unfrequently exhibits a greenish appearance. The globe is hard to the touch, and the sclerotica attenuated, and elevated by the vascular congestion of the choroid into bluish prominences or projections on different parts of the globe, especially upon its upper surface. The crystalline may be either implicated or otherwise;—in the former case, the opacity often assumes a sea-green colour; it is sometimes protruded against the iris, encroaching upon the anterior chamber, and even lying in close contact with the cornea. Vision is generally soon extinguished; but the occasional coruscations still

induce the unfortunate patient to cling to the fallacious hope of its effectual restoration.

The treatment of the variety first mentioned, differs in no material respect from that of iritis, and the prompt and judicious employment of the usual antiphlogistic measures—venesection, purging, leeching, &c.—together with the administration of mercury, and the application of belladonna to the brow, will often be followed by the happiest results. The same remedies are equally applicable to the second species, but the prognosis in this form of the disease, owing to the vitiated condition of the system, or omission to seek advice in its early stage, when alone any measures can be successful, is extremely unfavourable.

In those cases of internal ophthalmia consequent upon fever, cholera, parturition, and other enfeebled conditions of the system, the treatment must be regulated by the state of the patient and the urgency of the symptoms. Active inflammation frequently exists in conjunction with general debility, and may require topical depletion, while at the same time measures are adopted to support and invigorate the system. As a general rule, therefore, tonic medicines, as the sulphate of quinine, &c., are indicated under these circumstances, and may be prescribed conjointly with the alterative exhibition of mercury, and the occasional abstraction of blood by leeching or cupping. The iodate of potash with the neutral mixture or some light bitter infusion, may be beneficially employed in some cases, and the oil of turpentine, which has been found useful in certain forms of iritis, would probably be equally serviceable in these more extensive inflammations. Dr. Jacob of Dublin disapproves of the use of bark or quinine, recommended

by Dr. Wallace of the same city, and relies chiefly on mercury administered with a view to its constitutional impression, together with the application of belladonna to the margin of the orbit.

OPHTHALMITIS EXTERNA.

The investing membranes of the eye—the conjunctiva, cornea, and the sclerotica—are sometimes in like manner, simultaneously, and almost exclusively affected. A common example of this has already been noticed under the head of catarrho-rheumatic inflammation; and a similar state of things is not unfrequently witnessed in purulent or gonorrhœal ophthalmia, and as a consequence of wounds inflicted by particles of coal, stone, metal, &c., especially during the warm weather of summer, when from the intensity of light and heat, the activity of the arterial system, and the cutaneous excitement, there exists a greater predisposition to ophthalmic disease. The usual antiphlogistic means, venesection, local depletion, active purgatives, calomel and opium or the compound powder of ipecacuanha at night, mustard pediluvia, &c., should be promptly and efficiently prescribed in these traumatic inflammations, belladonna applied to the brow, and if, notwithstanding such treatment, suppuration ensues, the sufferings of the patient mitigated by puncturing the cornea.

SUPPURATION OF THE GLOBE.

Suppuration is a common termination of the severer forms of ophthalmia which have just been considered,

and its occurrence may be apprehended from the intense frontal or circumorbital pain, headache, throbbing and distension, with which they are often accompanied. In this condition of things pus is frequently effused into the anterior chamber, but, owing to the unyielding nature of the investing tunics, is attended with an increase rather than a diminution of the suffering; the conjunctiva becomes highly vascular and tumid, the cornea loses its transparency, and the inflammation having reached its highest point of aggravation, the vitality of the membrane is destroyed, and rupture takes place at its most prominent part, with relief of the symptoms, and, in some instances, collapse of the eyeball.

The treatment best adapted to avert this melancholy result has been fully described under several preceding heads, and need not be repeated on the present occasion. When it has proved unavailing, and suppuration has actually occurred, the agony of the patient may be greatly relieved by making a puncture through the cornea with the cataract knife or any convenient instrument, and the continued employment of measures calculated to allay pain and abate vascular excitement. The purulent secretion in such cases may be too viscid to escape through the opening, but enough of the aqueous humour is discharged to lessen the distension, and the turgescence of the vessels, pain, &c., gradually subsides after this has been effected. In less aggravated cases, the effusion being small, and some degree of vision still remaining, it will be more prudent to trust to the general treatment.

It occasionally happens that suppuration of the eyeball is produced by injury or disease of the fifth pair of nerves, the application of a ligature to the carotid

artery, and phlebitis following parturition, or extensive surgical operations.

HÆMOPHTHALMUS. HYPOÆMA.

Effusion of blood into the chambers of the eye, is a very frequent consequence of blows, wounds, &c.; and occurs to some extent in most of the operations for the formation of an artificial pupil. In other instances the hemorrhage is the result of some internal aberration, unconnected either with injury or inflammation, and has been apparently vicarious of the menstrual secretion, or the consequence of causes which produce an undue determination to the head, and hence not inappropriately denominated apoplexy of the eye. An interesting case of this kind is related by Mr. John Bell. The hemorrhage, induced originally by violent exertion, became subsequently periodical, and either recurred spontaneously, or through the influence of trivial agencies; each paroxysm being accompanied by tensive throbbing pain, increasing irritability of the eye, and progressive impairment of vision. A similar example is quoted by Mr. Lawrence from Professor Walther. The blood gradually subsides to the lower part of the chamber, but when the hemorrhage arises from contusion which has destroyed the organization of the hyaloid membrane, it remains diffused through the humours, and imparts to the pupil and cornea an appearance of uniform redness.

Considered in itself alone, the extravasation is a matter of little moment, for the blood is usually soon absorbed, and the aim of the surgeon is chiefly directed to the removal of the cause which induced it. When it

arises from external violence it indicates great injury to the organ, and is generally attended with loss of vision from the simultaneous concussion of the retina.

EXOPHTHALMUS.

Protrusion of the eyeball, called also proptosis, may be produced, as already described, by external violence, hypertrophy of the lachrymal gland, induration and suppuration of the cellular tissue, exostosis of the orbit, morbid growths within that cavity, and fungous excrescences which originate in the neighbouring parts. It occurs likewise, as a symptom in ophthalmitis, hydrophthalmus, and various other affections of the organ itself; and when accompanied with inflammation is more properly denominated exophthalmia. A common cause, apart from those just mentioned, is a congested state of the adipose membrane at the posterior part of the orbit, an affection occasionally observed in females, and not improbably connected with some derangement of the menstrual secretion. Under such circumstances, depletory measures,—venesection, purgatives, diuretics,—and such other treatment as may tend to restore functional action, will be found useful.

An instance of exophthalmus, occurring on both sides in the same individual, the result of an aneurism of each ophthalmic artery, is related by Mr. Guthrie.

ENTOZOA IN THE EYE.

The presence of parasitic insects in the eyes of

animals, more particularly in those of the horse, is not of very unfrequent occurrence, and could hardly have escaped the attention of persons conversant with their management; but their occasional existence also in the human eye, does not appear to have been suspected till it was announced by Monin in 1770. The accuracy of his statement, of which some doubt had been entertained, was fully established by Sæmmering in 1829; it was again confirmed by Mr. Logan in 1832, and about the same time the phenomenon was observed by Nordmann, Gescheidt, Von Ammon, and other German surgeons;—their investigations further revealing the fact of the existence of entozoa in the eyes of various animals,—quadrupeds, birds, fishes, and reptiles. According to these writers, the following species of worms have been found in the eye of man:—

1. *Filaria medinensis*, under the conjunctiva.
2. *Filaria oculi humani*, in the lens.
3. *Monostoma lentis*, “ “
4. *Distoma oculi*, “ “
5. *Cysticercus cellulosæ*, in the anterior chamber.
6. *Echinococcus hominis*, between the choroid and retina.

The presence of worms in the eye occasions more or less derangement of vision, and gives rise to various affections, according to the tissue in which they are situated. When they are visible, as in the instance of the *cysticercus cellulosæ*,—a small vesicle with slender neck which floats in the aqueous humour,—they may be removed through an incision in the cornea, but under other circumstances the irritation which they produce can only be treated on general principles.

ATROPHY OF THE EYEBALL.

It sometimes happens that, the secretory functions of the eye being destroyed by inflammation, the humours are absorbed, the membranes contract, and the globe shrinks to the bottom of the orbit;—the parts, though greatly reduced in size, still preserving their relative proportions. Surgical treatment is of no avail in this affection,—the process of diminution once begun, continuing until nature interposes an obstacle to its further progress.

In collapse or shrinking of the globe from suppuration of the eyeball, sloughing or ulceration of the cornea, and the operation for the removal of staphyloma, the transparency of the tissues is destroyed, the humours evacuated or absorbed, and the organ degenerates into a small yellowish tubercle, marked by sulci corresponding to the insertion of the four recti muscles;—the deformity thence arising, admitting of no relief but such as is afforded by the adaptation of an artificial eye.

In consequence of entropium, trichiasis, and other long-continued irritations, the cornea also becomes flattened and attenuated,—a state of things which has been called rhytidosis, or atrophy of that membrane.

HYPOBLEPHARA.

Artificial eyes, to which allusion was made in the preceding section, represent with considerable accuracy the anterior portion of the healthy organ,—the colour of the iris, the vessels of the conjunctiva, and the ordinary

size of the pupil,—and are formed of china, glass, or enamel,—the latter being now generally preferred. They are in the shape of a thin plate, convex exteriorly, and concave within; and so adapted to the remnant of the organ and the condition of the lids, as not to press injuriously upon these parts. When they are required to be manufactured for any particular case, a piece of lead, as large as the anterior surface of the sound eye, is introduced beneath the palpebræ of the vacant orbit, the cornea and pupil traced upon it as they are in the opposite organ, and afterwards sent, with a coloured representation, to the enameller. In this country artificial eyes have been hitherto imported, and generally from Germany; the surgeon selecting from among a number that which he deems best suited to the occasion. When there is much contraction of the lids, a plate of lead, of similar shape but smaller size, should be introduced for a time, in order to restore their expansion, and replaced at proper intervals by another of larger circumference, until the artificial eye, which should always be somewhat smaller than the natural one, can be worn without inconvenience or irritation. This should be inserted at first, for the space of a few hours only, and always removed, and placed in water at night;—an operation easily performed by depressing the lower lid, and raising the edge of the enamel with the head of a pin, when it readily falls into the hand. When properly adapted, the artificial eye moves in harmony with the other, especially if any considerable portion of the globe still remains; but it unfortunately loses its polish after the lapse of a few months, and this circumstance restricts its employment to those persons to whom expense is a matter of comparative indifference.

STRABISMUS.

Strabismus consists in some aberration from the uniform direction of the optic axes, so that when the individual looks at an object, one eye is involuntarily turned aside. The deviation, which generally affects one organ only, occurs in various degrees, and in much the greater proportion of cases is towards the nose, constituting the variety denominated strabismus convergens. It is distinguished from luscitas, or immovable distortion of the globe, by the cessation of the obliquity when the sound eye is closed; and the distinction is important, inasmuch as that affection, depending upon paralysis of one or more of the muscles, is curable, if at all, by means different from those lately employed in strabismus. The vision of the erratic eye is almost always imperfect; it is frequently myopic also; and this inequality between the retinae, may be regarded as the most common cause of the abnormal direction. Two images of the same object, but of unequal clearness, being presented to the mind, it necessarily inclines to the contemplation of the stronger and more correct impression, while it neglects or avoids the other, and, that its operation may not be embarrassed by it, instinctively averts the defective organ. When both eyes are affected the person is generally very near-sighted. The greater frequency of the deviation inwards, is explained by the superior strength of the rectus internus, its insertion nearer to the cornea, and the habitual convergence of the eyes.

Various causes have been enumerated as producing this deformity; some of which involve the brain either directly or sympathetically, and others are seated in the

eye itself. Congenital inequality between the retinae is, as has just been mentioned, the most frequent; but it may also arise from various organic changes within the cranium or orbit, hydrocephalus, convulsions, the irritation of dentition, worms, &c., whooping cough, strumous ophthalmia, corneal opacities, spasm of one of the recti muscles, small-pox, measles, scarlet fever, external violence, imitation, &c.

Strabismus depending upon causes of temporary duration may sometimes be cured by their removal; and when the aberration is occasional only, or still unconfirmed, something may also be accomplished in early life, by a process of education, which consists in covering the sound eye with a bandage for a short period once or twice a day, and endeavouring to call into action the weaker organ; at first separately, and afterwards in correspondence with its fellow. Spectacles stained black, except in the direction opposite to the deviation, are sometimes beneficial in the case of young children, and are among the best of the many contrivances which have been suggested for that purpose. In strabismus divergens, Weller recommends a pasteboard funnel, having an oval base, and an aperture at its small extremity, to be so applied as to include both eyes, and thus oblige the patient to look straight forward. In very early infancy the squint, when it exists only in slight degree, will often disappear in the course of two or three months, as the child acquires more control over the motions of the organ.

Measures such as those which have just been mentioned, constituted, until a very recent period, the course of treatment prescribed for the removal of this deformity, and, in the opinion of the present writer, are still

the only ones that can be legitimately resorted to. A very different impression, however, has lately been entertained in consequence of the suggestion by Dr. Stoy Meyer, in 1838, of the division of one of the recti muscles. The practicability of this operation having been demonstrated the following year by Professor Dieffenbach of Berlin, it acquired, from the novelty of the expedient, the facility of its performance, and its capability of being made subservient to purposes of gain,—a prime consideration with those who, to attain their own selfish objects, basely degrade a noble profession to the low level of mercenary art,—a popularity as unprecedented as it was undeserved. Nor was this erroneous estimate of its value confined to the sciolist and the charlatan; men of the soundest judgment and most honourable character, pleased with the discovery of what purported to be a prompt and effective remedy for a complaint always unmanageable, and often incurable by ordinary means, were in some instances induced to give to it the high sanction of their authority. Mr. Lawrence has occupied nearly thirty pages of his work with its discussion, though he merely describes the operations of others, and neutralizes the approbation which such extended notice implies, by the prudent acknowledgment that if he were the subject of the defect, he should be inclined to wait for further and conclusive evidence of its utility; M. Velpeau, notwithstanding its already ascertained failure, or the substitution of a worse deformity, in one-half of the cases on which he had operated, pronounces it, less cautiously, “a measure of which the nineteenth century may justly be proud,” while, at the same time, he candidly admits that a definite judgment cannot yet be formed; and a

committee of the French Academy in 1841, three years after its proposal, not only declare their opinion that it is entitled to admission into the catalogue of regular operations as one of the recognised achievements of surgery, but award the prize of three thousand francs each, to its inventor and first performer.

Experience, to whose arbitrament the appeal is made by the two eminent individuals above-mentioned, has disappointed the expectations which they cherished; and the operation of myotomy for the cure of strabismus has already lost much of its ephemeral popularity. The discredit into which it has fallen, has been ascribed by its advocates, partly to the multiplicity and inappropriateness of the methods employed,—each operator claiming superiority for his own as possessing something peculiar and excellent;—to its indiscriminate performance in all cases by the unskilful and the unprincipled; and to the extravagant anticipations excited in the public mind by the mendacious announcements which were so unblushingly put forth. But these considerations alone, however they may have severally contributed to accelerate that result, do not furnish the true explanation. The operation, though ingenious in its conception, is founded upon principles radically unsound; for an important connexion of the globe being severed, there is nothing to countervail the action of the other muscles, and prevent the protrusion and eversion, which, when the tendon is completely divided, is so liable to occur. It is inapplicable to cases of congenital inequality between the retinae, because, as just intimated, the weaker organ interfering with the other, is involuntarily turned aside, and though brought back by the separation of the tendon, would, if it did not tend to the opposite direction, be

again averted, for the same reason, after the muscle, by reunion, or shortening, had regained its control; and it is also improper when the deviation arises from other causes, not only on account of the frequent return of the obliquity, but for the substitution which it often makes of exophthalmus, strabismus divergens, or some equally disagreeable deformity.

The author, acting upon the principle of not doing to others that which, under similar circumstances, he would not have done to himself,—the only safe guide in many cases of doubt and difficulty,—has invariably declined all applications for the division of the tendon, and as among the multiplicity of the proposed methods, no one can be said to have received general sanction, may be excused for not encumbering his pages with unnecessary details.

OSCILLATION OF THE GLOBE.

In certain cases the balance of power between the muscles of the eyeball being destroyed, the globe acquires an unsteady or oscillatory motion, of which the individual is unconscious, and which he has no power to restrain. It is a common attendant upon congenital cataract, especially when it has existed for some years, and furnishes an argument for the early removal of the lens; in order that, vision being restored, an opportunity may be afforded to regain the control of the organ, while the habit is yet unconfirmed. If the retina preserves its functional ability, this is sometimes very gradually accomplished; but when the case is complicated with amaurosis, either partial or complete, the rolling motion continues through life.

Persons of nervous temperament are occasionally affected with clonic spasm of one or more of the muscles of the eye, and the movement, which most frequently assumes a direction from side to side, is denominated nystagmus. Tonic contraction is sometimes observed in hysterical and hypochondriacal individuals, and after wounds and contusions,—the eye being turned of course in the direction of the affected muscle.

OPHTHALMOPLÉGIA.

Paralysis of the muscles of the globe may arise from causes affecting either the brain, or the nerves in their progress to the place of distribution. The third pair, or motor oculi, which is most extensively distributed, supplying three of the recti muscles, the inferior oblique, and the levator palpebræ, is most commonly affected, and the eye is permanently drawn towards the temple by the action of the abductor muscle. The ciliary nerves being also involved in this species of paralysis, the iris is motionless, the pupil dilated, and there is more or less indistinctness of vision. The trochleares and abducentes may be likewise separately implicated, and in the latter case the eye is drawn towards the nose by the action of the internal rectus. Paralysis of all the muscles of the eyeball is of still more rare occurrence, and constitutes the condition denominated ophthalmoptosis, in which the globe, no longer restrained by its muscles, falls forward against, and protrudes the lids. The prognosis is most favourable when the third nerve only is affected.

The treatment must be regulated by the nature of the

cause. When headache, vertigo, &c., give reason to suspect the existence of any cerebral congestion, general and local depletion, purgatives, mercury, and other appropriate remedies will be required; if the abdominal viscera are deranged, the cure will be accomplished by the restoration of their healthy action; and where neither of these conditions exist, advantage may be derived from counter-irritation by blister, stimulating embrocations, electricity, and the endermic employment of strychnia. In cases depending upon organic changes within the cranium, antiphlogistic measures may retard, but cannot arrest the progress of the disease.

MYOPIA.

Near-sightedness.

When the rays of light are not collected into a focus upon the retina, but, owing to the too great refractive power of the eye, converge before they reach that membrane, vision is rendered indistinct, and the person,—who is said to be myopic or near-sighted,—is obliged to increase their divergence by holding the object nearer to the organ, or by wearing a concave glass, which produces the same effect by refracting the rays from the perpendicular.

The defect has been attributed to various causes,—preternatural density of the transparent media, unusual convexity of the cornea or crystalline, elongation of the eye in its antero-posterior diameter, and every supposable condition by which it was imagined such a result could be produced. Several of these circum-

stances may be combined in any particular case, but it is probably more generally dependent upon that last mentioned. The eye in a state of relaxation, being adapted for distant vision, an effort is required for the perception of proximate objects, and this is evidently connected with the action of the muscles. The imperfection is consequently most prevalent in cities, among literary persons, and those whose occupation requires the close exercise of their eyes; while it is comparatively rare in the country, and is seldom observed among sailors, soldiers, and others, whose sphere of vision is more extensive, and whose organs being constantly engaged in the view of remote objects, are in their natural state of repose. It is generally believed that it diminishes with the advance of years, and that those whose sight is thus defective in youth, see better than others in the evening of life; this, however, is true only when the causes which originally induced it, no longer continue to operate; under other circumstances, the imperfection frequently continues in the same degree, or the individual may even become more near-sighted as he grows older.

Myopia occasionally depends on original malformation, as is shown by its frequent existence in several members of the same family, and also by an unnatural prominence of the eye; more commonly, however, it is an acquired defect, and attracts attention chiefly about the age of puberty; that being the period when the circumstances producing it begin to operate with greatest intensity.

While the affection is yet unconfirmed, a cure may perhaps be accomplished by the avoidance of the causes above-mentioned, and the adoption of a mode of life

which involves much exercise in the open air, and especially in the country. If such a change be impracticable, or if the myopia be too considerable to be benefited thereby, recourse may be had to concave glasses, and those of the lowest number or longest focus through which objects can be distinctly seen of their natural magnitude, and without straining or fatiguing the eye, should be selected. They should be worn as seldom as possible, only on occasions when the assistance which they afford is particularly required, and ought not to be hastily exchanged for others of greater refractive power; otherwise, the eye adapting itself to each succeeding gradation, the defect will be greatly aggravated, and the organ permanently injured.

PRESBYOPIA.

As life advances the eye undergoes certain changes which impair its refractive power, in consequence of which the focal distance of the lens is removed beyond the retina, the perception of near objects is rendered indistinct, and the individual becomes far-sighted or presbyopic. Shortening of the antero-posterior diameter of the eye from diminished secretion of the humours, has been mentioned as one of the causes which produce this effect. It is not, however, universal in old age, nor is it confined to that condition; being sometimes observed long before the middle period of life, at which time it is usually first perceived, and occasionally met with even in children;—anomalies, which, like myopia occurring under similar circumstances, depend on original conformation. The only

remedy is a convex glass, which corrects the divergence, and concentrates the rays along the visual axis.

Oculists are often consulted about the selection of spectacles, and a few remarks on this subject may therefore not be inappropriate under the present head. Flint glass, as being free from any greenish tinge, is the material commonly chosen for their manufacture, but the best are made of the rock crystal of Brazil, and by some persons amber is deemed preferable to either.

They are frequently used plain, to protect the eye from an unpleasant degree of light, and are coloured to suit the varying fancies of individuals; the blue or azure are generally preferred to the green, through which objects soon contract a yellowish or reddish tinge.

Glasses convex on both surfaces are called lenticular or bi-convex; plan-convex, when one surface only is convex; and concave-convex, when convex on one side and concave on the other. The last are of weakest power, and admit of lateral vision without turning the head, which the other varieties do not.

Concave glasses are also bi-concave, plan-concave, and convex-concave. The concave-convex, and the convex-concave, are called periscopic glasses, and were recommended by Dr. Wollaston for the reason just assigned, of allowing greater latitude of vision. The bi-concave, and bi-convex glasses are used respectively for myopic and presbyopic persons. In making the selection for any particular case, it is important to ascertain whether vision is the same in both organs; because if otherwise, glasses of different numbers must be chosen. The rules given under the preceding head should direct their choice, and govern their employment; and when thus properly adapted, they afford an invaluable corrective of the defect for which they are intended.

MALIGNANT DISEASES OF THE EYE.

SCIRROPIITHALMIA.

Cancer of the Eye.

SCIRRHIOUS induration and cancerous ulceration of the eye, are very particularly described by the older writers, but there is reason to believe that this peculiar degeneration is much less frequent than was formerly supposed. It is only of late years, that the malignant affections of this organ have been accurately discriminated; and several diseases which were once confounded under the general name of carcinoma, are now ascertained to differ in almost every thing except their fatality. Mr. Wardrop has never met with an instance where the coats or contents of the eyeball, were the primary seat of cancer, and intimates a doubt whether it ever originates there; Mr. Travers expresses his conviction that it is confined to the lachrymal gland, conjunctiva, and eyelids; and Mr. Watson states, that though he has witnessed many cases of cancer of the orbit, he has never known it to affect any of the coats of the eye, except the conjunctiva.

What these writers affirm, might have been *a priori* anticipated, from the structure of the organ; it could hardly be imagined that the fibrous textures of the cornea and sclerotica were susceptible of such a change; and the internal parts of the eye,—the choroid and retina,—are more liable to other malignant altera-

tions. Mr. Lawrence, however, whose general experience coincides with the authorities above-mentioned, relates a solitary instance, in which the globe was converted into an apparently scirrhus mass, presenting an irregular varicose surface, and exhibiting no traces of its original organization; the complaint was of long standing, and ulceration had taken place, but there was no offensive discharge, and the general health continued unimpaired. Mr. Middlemore also, appears to have met with several cases of scirrhus in advanced life, consequent upon repeated attacks of inflammation, and characterized by the severity of the pain, shrinking and induration of the organ, and other symptoms indicative of their cancerous nature. On dissection, the sclerotic was ascertained to be thickened, its proper texture interlaced by bands of a firm white substance, and the contents of the eyeball converted into a solid yellowish mass, permeated by fibrous matter, resembling the dense white cellular striæ of a scirrhus mamma.

Treatment.—As in carcinoma of other organs, extirpation is the only remedy; and in the commencement of the complaint, while the globe is freely movable, the cellular membrane and neighbouring parts being yet uninvolved, there is reason to hope that a permanent cure may be thus effected. Under opposite circumstances, the prognosis is much more unfavourable; but inasmuch as the operation affords the only chance of escape, it should still be proposed, provided the extent of the disease does not preclude the possibility of removing it entirely. In the incipient stage, while there is any doubt as to its real nature, advantage will be derived from the repeated application of leeches, and the use of tonic remedies, as the sulphate of quinine and

the carbonate of iron, mild aperients, and small doses of the blue pill in combination with the extract of cicuta. When the disease has unfortunately been suffered to advance until extirpation is no longer deemed advisable, the resources of art may still be employed in mitigating the sufferings of the patient, and smoothing his rugged passage to the grave. Attention to the state of the digestive organs, the internal exhibition of opium and other narcotics, and warm fomentations containing laudanum or the vinous tincture of opium, are the means most conducive to this end.

MELANOSIS OF THE EYE.

Melanos is a rare disease, and has only recently begun to attract attention. Like carcinoma, it occurs either at or after the middle period of life, and generally makes its appearance simultaneously in other parts of the body. It has been confounded with fungus hæmatodes, with which it certainly possesses many features in common, but differs from that affection in the period of its attack, its dark or black colour, and the inorganic character of the deposition. It commences with an irritable state of the eye, a turbid condition of the humours, and impairment of vision, which is speedily destroyed altogether; and is attended in its progress, with distension and irregular enlargement of the globe, attenuation and dark-brown discoloration of the sclerótica, and opacity of the lens. The pupil is dilated, the iris convex anteriorly, and a dark slate-coloured substance may be observed at the bottom of the eye, which gradually advances, in the form of a black dingy

mass, until it is arrested by the cornea. The eyeball enlarges, the unequal prominences increase and are covered with varicose vessels, sloughing or ulceration follows, the surrounding parts become contaminated, and the whole is converted into a dark fungus, accompanied with frequent hemorrhage, or the discharge of a thick, black, and grumous fluid. The disease extends along the optic nerve to the brain, and often shows itself also in other situations. The morbid secretion sometimes occupies the place of the vitreous humour, but is more generally deposited between the choroid and retina. To the symptoms above enumerated as distinguishing melanosis from fungus hæmatodes, may be added the absence of any metallic appearance, the peculiar discoloration of the sclerotica, its more gradual progress, and the slighter degree of pain with which it is accompanied.

Very little is known of this formidable affection beyond the malignancy of its nature. Extirpation presents the only chance of recovery, and the hope thus afforded, is scarcely strong enough to hold out any encouragement to the operation, unless it be undertaken in its earliest stages, while the disease is still confined to the interior of the eye, and the general health unimpaired. When performed under other circumstances, it has commonly returned, either in the orbit, or some other part of the body.

FUNGUS HÆMATODES OF THE EYE.

Fungus hæmatodes is a much more frequent disease than either of those which have just been described, and

is commonly observed in childhood ; though instances of its occurrence in more advanced life have also been recorded. It is attended with early destruction of vision, and in its incipient stage may be recognised by a peculiar lustrous or metallic appearance at the posterior part of the eye. The pupil, even at this period, is dilated and motionless, the vessels of the conjunctiva loaded with blood, pain is present in various degrees, and the sympathetic irritation of the constitution betrays the gravity of the local disorder. As the disease advances, a yellowish spongy body, partially covered with vascular ramifications from the arteria centralis, may be seen approaching towards the pupil ; the humours become turbid, the globe tense, the pain increases, and the lens is pushed forward by the fungus. The cornea now becomes prominent and opaque, the sclerotica is attenuated and presents a livid hue, the superficial vessels exhibit a still more varicose appearance, the globe is enlarged and irregularly tuberculated from the partial bulging of its investing membranes, and the morbid growth eventually makes its way externally, protruding in the form of a soft bleeding mass, portions of which occasionally slough, attended with a fetid sanious discharge, and profuse hemorrhage. The subsequent progress is much more rapid, and the patient, worn out by constitutional irritation, and exhausted by repeated loss of blood, finds release from his sufferings only in death.

When the eye has been removed before the progress of the disease has confounded all traces of its original organization, the retina and optic nerve have appeared to be the primary origin of this destructive malady ; the lymphatic glands ultimately become affected, not unfrequently also the bones of the orbit are involved, and me-

dullary formations exist coterporaneously in the brain and other parts of the body. The seat of the disease in the nervous tissue, explains the early loss of vision while yet there is no apparent disorganization of the 'organ'.

The metallic appearance at the bottom of the eye is not peculiar to this affliction, having been likewise observed in cases which never evinced any malignancy of disposition. It may be produced by the absorption of the pigmentum nigrum, or lymphatic deposition upon the retina, is sometimes seen after penetrating wounds of the eye, and has been elsewhere noticed as an occasional symptom in sub-choroid dropsy.

Fungus hæmatodes, the pathology of which was first described by Mr. Wardrop, is a constitutional and fatal disease, from which even the knife of the surgeon affords scarcely a probability of escape;—the malady having, with very few exceptions, reappeared after extirpation, though the operation was performed in the incipient stage, and under circumstances the best calculated to ensure success. It may sometimes be resorted to in order to alleviate pain and protract existence, but when the character of the disease is unequivocally ascertained, it offers little or no prospect of permanent relief. An instance of successful termination at a very early age is, however, recorded by Professor Panizza; and Mr. Houston, in a note to his edition of this work, refers to the fact of there having been no return of the disease in the case of the gentleman—then living—upon whom the operation for its cure was first performed many years ago in Edinburgh.

A mild antiphlogistic treatment during the occasional attacks of inflammation which accompany its formative period; and subsequently the employment of narcotics,

the use of strong anodyne fomentations, and lotions of the chloruret of soda to correct the fetor of the discharge, constitute the whole of our present resources in the management of this dreadful disorder. Mr. Tyrrell strongly recommends a gentle mercurial course, with attention to the improvement of the general health; and states that he has known several cases in which the disease was arrested, and the globe became atrophied under such treatment.

There are other forms of malignant disease which do not exactly correspond to either of those which have just been described, but appear to consist in an assemblage of morbid productions,—fungous, melanoid, sarcomatous, cartilaginous, osseous, and fluid. Such hybrid cases probably depend upon the changes which inflammation and other less appreciable agencies superinduce in the action of the organizing vessels, and are said to justify a more favourable prognosis than where the affection preserves its perfect purity of type.

EXTIRPATION OF THE EYE.

To a certain extent increased action is essential to the reparative process, but the tendency usually is to transcend the required limits, and it is therefore highly conducive to the successful issue of every considerable operation, that the constitution of the patient should be in such a state, as will most effectually avert the occurrence, or moderate the accession of inflammation. To accomplish this, a preparatory treatment is frequently indicated, and is especially required when an operation is to be performed in the immediate vicinity of any vital

organ ; or where, as in the eye, the functions of the part may be speedily annihilated by the morbid changes produced by inflammation. The nature and activity of the means employed for this purpose, must be regulated by the circumstances of each particular case, for it would be manifestly preposterous to prescribe the same treatment when the system was exhausted by the pain and irritation of a protracted disease, as would be proper while the general health continued still unimpaired. The preceding remarks apply in all their force to the formidable operation about to be described. All due precautions, therefore, having been sedulously adopted, the patient should be placed in a supine position, and the palpebræ divided at their external commissure, so that they may be everted to an extent sufficient to expose the margin of the orbit. A strong ligature is now passed through the globe, and being drawn upwards by an assistant, the conjunctiva is divided along its lower portion, by means of a small straight scalpel, cutting through the fibres of the inferior oblique muscle, and detaching the eyeball from the floor on which it rests. The incision is then continued along the upper surface, separating the conjunctiva from the lid, and dividing the tendon of the obliquus superior,—a part of the operation, during which much caution is requisite to avoid injuring the brain. The diseased mass having been thus detached around its circumference, the next step is to sever its connexion with the optic nerve, by the curved scissors or scalpel, introduced at the external canthus. The interior of the orbit should afterwards be carefully explored, with a view to the removal of any indurated part which may remain ; and it will be proper, also, to include the lachrymal gland, if it have not been previ-

ously taken away. The hemorrhage from the ophthalmic artery is sometimes considerable, but generally ceases spontaneously; if otherwise, it may be necessary to apply pressure by means of a roll of lint. The subsequent treatment consists in replacing the palpebræ, uniting the divided commissure by one or more sutures, and covering the whole by a fold of linen moistened with cold water, and supported by a roller. The patient should be treated as for a wound of equal magnitude elsewhere, with the additional caution rendered necessary, in the present instance, by the proximity of the brain. Quietude, laxatives, confinement to a darkened room, and a restricted diet, will of course be required in every case. On the succeeding day, any foreign substance which may have been introduced to arrest the bleeding, must be carefully removed; and if inflammation supervene, general and local depletion, purgatives, warm anodyne injections, and fomentations, will be proper.

VOCABULARY.

OPHTHALMOLOGY is a branch of surgery which has been more confused by artificial distinctions, and burdened with barbarous terms, than almost any other, and as the latter cannot be altogether omitted, it has been thought expedient to exhibit them in one view, rather than offend the eye by their insertion in the text. The following glossary, the basis of which has been adopted from the little work of Mr. Walker, is accordingly subjoined. It has been considerably enlarged both by the author and his English editor, and is now perhaps the most copious extant; containing much practical and scientific information, and giving a brief account of many diseases not described in the body of the work.

AMAUROSIS (*αμαυρω*, *to darken*). Dimness, or abolition of sight, generally accompanied with dilatation of the pupil, but without any other apparent defect; the parts anterior to the retina preserving their natural transparency, and the globe its healthy condition. It is a disease, or, more properly, a symptom, depending on various pathological conditions of the retina, optic nerve, and brain, and often sympathetic of morbid action in other parts of the system.

AMAUROTIC CATS-EYE. A variety of glaucoma, in which the pupil presents a deep-yellow, brownish-yellow, opa-

lescent, or metallic reflection, concave in its appearance, and occupying the whole fundus of the globe. It has been thought to resemble the eye of the cat in the dark, or, more accurately, the mineral called catseye. It is most perceptible in a moderate light, at the distance of a few feet, and is liable to be confounded with a somewhat similar phenomenon seen in the early stage of fungus hæmatodes. The complaint, which is rarely met with, is usually connected with atrophy or marasmus, and is generally observed in persons who are far advanced in years.

ADNATA. The tunica conjunctiva. So named from its close adherence to the anterior part of the eyeball.

AKYANOBLEPSIA (α , *priv.*; $\kappa\alpha\nu\omicron\varsigma$, *blue*; $\beta\lambda\epsilon\pi\omega$, *to see*). A want of power to distinguish the shades of the blue colour.

ÆGILOPS ($\alpha\iota\gamma$, $\alpha\iota\gamma\omicron\varsigma$, *a goat*; $\omega\psi$, *the eye*). An ulcer at the inner canthus of the eye, supposed by the ancients to be common to the animal from which the appellation is derived.

ADENITIS CONTAGIOSA PALPEBRARUM ($\alpha\delta\eta\nu$, *glandula*). Purulent ophthalmia. Supposed by some of the German writers to have its seat in the glands of the eyelids, producing a granular degeneration of those parts; which morbid condition is liable, by accidental causes, to severe aggravation, involving the whole surface of the conjunctiva.

ANERYTHROBLEPSIA (α , *priv.*; $\epsilon\rho\upsilon\theta\rho\omicron\varsigma$, *red*; $\beta\lambda\epsilon\pi\omega$, *to see*). A defect of vision, in which the patient is unable to distinguish the different shades of red.

ATRESIA IRIDIS (α , *priv.*, and $\tau\iota\tau\rho\alpha\omega$, *to perforate*). Closure, occlusion, or imperforation of the pupil.

ANTERIOR CHAMBER. The space between the cornea and the iris, occupied by the aqueous humour.

ALBINISM. **LEUCÆTHIOPIA** (λευκοθῆα and ωψ.) A congenital defect, in the highest grades of which the pupil and iris, owing to the absence of the pigmentum nigrum, are of a deep red colour, as in white rabbits. In this aggravated form it is accompanied with great confusion of vision, and extreme sensibility to light; but it is often seen less strongly developed, the iris preserving its colour, and the pigment being apparently defective only in the posterior part of the eye. The sight under such circumstances is more acute than usual, especially in the shade or in the dusk of evening. The author is at present attending in consultation with his friend Dr. Parrish, an individual, five of whose brothers and sisters were thus affected from birth; one of them, having passed the middle period of life, has become quite blind, and the patient himself is afflicted with glaucoma.

ALBINO (*albus, white*). A person in whose eyes the pigmentum nigrum is deficient, or altogether wanting.

ARIDURA BULBI. Collapse or shrinking of the globe.

AMPHIBLESTRODITIS (αμφιβλεηστρον, *a fish-net*; εἶδος, *form*). Retinitis.

ACROMATOPSIA (*α, priv.*; χρομα, *a colour*; ωψ, *the eye*). An imperfection usually congenital, which consists in an inability to distinguish colours.

ANOPHTHALMOS (*α, priv.*; ὀφθαλμος, *the eye*). **ANOPSIA** (*α, priv.*; ωψ, *the eye*). Absence of the eye,—a very rare defect; a few cases only having been recorded.

ATONIA PALPEBRARUM. **ATONIATON BLEPHARON** (*α, priv.*; τῶνος, *tone*; βλεφαρον, *the eyelids*). Relaxation of the eyelids.

ATROPHY (*α, priv.*; τροφή, *nourishment*). Shrinking of the eyeball.

ALOPECIA (αλωπεκία, *defluvium capillorum*). Partial or total

loss of the cilia;—a permanent defect produced by the destruction of their bulbs.

ABDUCENTES. The sixth pair of nerves, or *motores externi*.

ALBUGO. A dense white opacity of the cornea, the consequence of interstitial lymphatic deposition.

ALBUGINEA. The tunica sclerotica, so called from its white appearance.

AQUA MORGAGNI. The appellation given to a minute quantity of fluid, supposed by Morgagni to be contained between the lens and its capsule.

AQUEOUS HUMOUR. The fluid occupying the anterior and posterior chambers of the eye.

AQUO-CAPSULITIS. Inflammation of the capsule of the aqueous humour, or lining membrane of the cornea. Keratoiritis.

ARCUS SENILIS. An opaque circle on the circumference of the cornea, occasionally seen in advanced life.

ACHLYS (αχλυσ, *a mist*). Defect of vision from ulceration or cicatrization of the cornea, over the centre of the pupil.

AMBLYOPIA (αμβλυσ, *dull*; ωψ, *the eye*). Defective vision. Incomplete amaurosis.

ANCHYLOPS (αγχι, *near*; ωψ, *the eye*). See *Ægilops*.

ANCHYLOBLEPHARON (αγκυλος, *crooked*; βλεφαρον, *the eyelid*). Cohesion of the eyelids at their ciliary border.

BLENNORRHŒA. BLENNORRHAGIA (βλεννα, *mucus*; ρεω, *to flow*). Purulent or gonorrhœal ophthalmia.

BLENNOPHTHALMIA. Purulent conjunctivitis.

BLEPHARA (βλεφαρον, *palpebra*; βλεπω, *aspicio*). The eyelids,—the term signifying a curtain or covering for the eyes.

BLEPHARIDES (βλεφαρις, *an eyelash*). The cilia or eyelashes.

BLEPHARITIS. Purulent ophthalmia. Inflammation of the eyelids.

BLEPHAR-OPHTHALMITIS. **BLEPHARITIS IDIOPATHICA.** Inflammation of the eyelids.

BLEPHARO-BLENNORRHOEA. **BLEPHAR-OPHTHALMIA.** **BLEPHARO-OPHTHALMITIS GLANDULOSA.** Purulent or gonorrhœal ophthalmia.

BLEPHAROPHTHALMIA ULCEROSA. **OPHTHALMIA PSORICA.** Inflammation of the eyelids with ulceration. Psorophthalmia.

BLEPHARONCHIOSIS (*βλεφαρον* and *χωσις*, *obex*). Tumours in the eyelids.

BLEPHAROPLEGIA (*πληγη*, *a stroke or blow*). Paralysis of the eyelid.

BLEPHAROPTOSIS (*πτωσις*, *a falling down*). Inability to raise the upper eyelid from paralysis of the levator palpebræ, or relaxation of the integuments.

BLEPHAROSPASMUS (*σπασω*, *to draw*). Spasm of the eyelids.

BUPHTHALMOS (*βους*, *taurus*; *οφθαλμος*, *the eye*). Dropsical enlargement of the eye.

CANAL OF PETIT. A canal around the circumference of the lens, formed by the *membrana vasculosa retinae*.

CANTHUS (*κανθος*, *the angle of the eye*). The commissure of the eyelids.

CANTHITIS NASALIS. Inflammation of the lachrymal caruncle.

CATOPTRICS (*κατα*, *against*; *οπτομαι*, *I see*). The branch of optics that treats of the laws of reflected light. It has been ingeniously applied as a means of diagnosis in cataract, amaurosis, &c.,—the presence of the three images reflected from the cornea, the anterior, and the posterior hemispheres of the crystalline capsule, establishing the fact of the transparency of the lens. What effect the absorption of the pigmentum nigrum, and other mor-

bid changes of the parts behind the lens, which occur in some cases of glaucoma, may have upon the distinctness of the inverted and posterior upright images, is, however, a subject on which further information is desirable.

CAPSULE. The membrane investing the crystalline lens.

CAPSULITIS. Inflammation of the capsule of the lens.

CARUNCULA LACHRYMALIS. A small glandular body situated in the inner angle of the eye.

CATARACTA (καταρασσω, *to break or disturb*, because the disease confounds, or destroys vision). Opacity of the crystalline or its capsule.

Capsularis. Opacity of the capsule of the lens.

Capsulo-lenticularis. Opacity of the capsule and crystalline.

Centralis. Opacity of the central portion of the lens or capsule.

Dura, Caseosa, Gelatinosa, Fluida, &c. Distinctions founded on the consistence of cataract.

Fluida Dura. Hard opaque nucleus with fluid circumference of the lens.

Gypsea. Conversion of the capsule into a chalky or bony substance.

Immatura. Incomplete or unripe cataract.

Lactea. Milky cataract.

Lenticularis. Simple opacity of the lens.

Lymphatica. False cataract from effusion of lymph into the pupil.

Marmoracea, Fenestrata, Punctata, Stellata, Striata, Variegata, Dimidiata, &c. Distinctions drawn from the different appearances of cataract.

Membranacea. False cataract from effusion of lymph into the pupil, obstructing the aperture as though it were closed by a membrane.

Pyramidalis. False cataract, in which the effused

lymph projects through the pupil into the anterior chamber.

Siliquosa. Cataract with a shrivelled and opaque capsule.

Trabecularis. Trabecular fibrinous cataract; formed by a bar of coagulable lymph extended across the pupil.

Pigmentosa. False cataract from the deposition of the colouring matter of the uvea upon the capsule of the lens.

Viridis or *Glaucomatosa*. The complication of lenticular cataract with glaucoma.

CATARRHAL OPHTHALMIA. Conjunctivitis accompanied with a mucous or puriform secretion, and arising from atmospheric vicissitudes.

CATARRHO-RHEUMATIC OPHTHALMIA. Inflammation caused as above, affecting simultaneously the conjunctiva and sclerotica.

CHALAZION (*χαλαζα*, *grando*, hail). A little tumour on the border of the eyelid, so called from its supposed resemblance to a hailstone.

CLAVUS (*the head of a nail*). Protrusion of the iris through an opening in the cornea, in the form of a large and dark-coloured tumour.

CERATITIS (*κερας*, *a horn*). Inflammation of the cornea.

CERATOCELE (*κερας*, and *κηλη*, *tumour*). Hernia of the cornea, caused by the protrusion of the membrane of the aqueous humour through an opening in that tunic.

CERATOTOME (*κερας* and *τομη*, *section*). A knife for the incision of the cornea.

CHEMOSIS (*χημωσις*, *χαινω*, *to gape*). An inflammatory swelling of the conjunctiva, accompanied with serous effusion into the subjacent cellular tissue, and frequently seen in the severer grades of catarrhal and purulent

ophthalmia ; the tumid membrane forms a ring encircling and overlapping the cornea, and, in some instances, even protruding from between the eyelids.

CILEO (*cileo, to move about*). The eyelashes.

CILIARY DUCTS. The excretory ducts of the meibomian glands, opening on the inner edge of the eyelids.

CILIARY MARGIN. The free extremity of the eyelid at the junction of its mucous lining with the integuments.

CIRSOPHTHALMIA (*κίρσος, varix ; οφθαλμος, the eye*). A general varicose condition of the bloodvessels of the eye.

CHIASMA (*χιασμα, decussation*). A term implying decussation at the junction of the optic nerves.

CHOROID (*χοριον, choroid, and ειδος, likeness*). The dark-coloured and highly vascular membrane, which secretes the pigmentum nigrum, situated between the sclerotica and retina.

CHOROIDITIS. Inflammation of the tunica choroidea or vasculosa.

CHROMATOPSEUDOPSIA (*χρομα, colour ; ψευδω, to deceive ; ωψ, the eye*). CHIROMATODYSOPIA, CHIROMATOMETABLEPSIA. Difficulty in distinguishing colours.

COLLYRIUM (*κολλα, glue, and ρεω, to flow*). A lotion for the eye ; so termed because these preparations were formerly of a glutinous nature.

COLOBOMA IRIDIS (*κολοβω, to mutilate*). A congenital fissure in the iris, generally situated at its inferior portion, and not unfrequently extending through the choroid and retina.

COLOBOMA PALPEBRARUM. A defect in the eyelids similar to the above, resembling the hare-lip.

CONICAL CORNEA. Staphyloma Pellucidum. A disease in which the cornea, retaining its transparency, projects in a conical or sugar-loaf form.

CONJUNCTIVA. (*Conjungo, to join together*.) The mucous

membrane which lines the eyelids, and covers the anterior portion of the globe. The adnata.

CONJUNCTIVITIS CATARRHALIS. Catarrhal ophthalmia.

CONJUNCTIVITIS PURO-MUCOSA, CONTAGIOSA, VEL EGYPTIACA. Purulent ophthalmia.

CONOPHTHALMIA. Conical cornea.

CONSIDENTIA, OR SUBSIDENTIA PUPILLÆ. Closure of the pupil.

COREDIALYSIS (κορη, *pupil*; διαλυσis, *separation*). An operation for artificial pupil, in which a portion of the iris is separated from its ciliary connexions.

COREMORPHOSIS (κορη, *pupil*; μορφωσις, *formation*). The formation of an artificial pupil.

CORETOMIA, CORENECTOMIA, CORETONECTOMIA (κορη; τομη, *sectio*). The formation of an artificial pupil by the excision of a portion of the iris.

COREPARELKYKIS (κορη, and παρελκω, *protraho*). A mode of performing the operation for artificial pupil, by separating a portion of the iris from its connexions with the ciliary ligament, and fixing it in a wound of the scleroticæ.

CORNEA (*cornu, horn*). The anterior transparent portion of the globe.

CORNEITIS. Inflammation of the cornea.

CORONA, OR ZONA CILIARIS. The indented circle on the vitreous humour, caused by the ciliary processes.

CORPUS CILIARE. The radiated wreath or circle, formed by the ciliary processes.

COUCHING. An operation for the cure of cataract, in which the lens is depressed below the axis of vision.

CHIRUPSIA (χρῶα, *colour*; οψis, *vision*). CHROMOPSIA. Cases in which objects appear of a different colour from that which they naturally possess.

CURETTE. An instrument shaped like a minute spoon or scoop, sometimes used in the extraction of cataract.

CRYSTALLINE LENS. The convex transparent body, usually of the consistence of wax, situated immediately behind the pupil.

CYSTITOME (κυστις, *vesica* ; τομη, *sectio*). An instrument for opening the capsule of the lens.

CYCLOPIA (κυκλος, *ciculus* ; ωψ, *the eye*). A union of both eyes ; the malformation is usually accompanied by some abnormal conformation of the brain. It sometimes happens that the eyes are contained in one orbit ; in other cases they are partially confounded. The synonyms, **MONOPSIA**, **MONOPHTHALMIA**, and **RHINENCEPHALIA**, have also been used to denote the same defect.

DACRYOADENITIS (δακρυω, *to weep* ; αδην, *glandula*). Inflammation of the lachrymal gland.

DACRYOADENALGIA. Neuralgia of the lachrymal gland.

DACRYOPYORRHOEA (δακρυω ; πυον, *pus* ; ρεω, *to flow*). A discharge of tears mixed with pus.

DACRYOPS (δακρυ, *a tear*, and ωψ, *the eye*). Swelling of the lachrymal sac.

DACRYOMA (δακρυω, *to weep*). An impervious state of the puncta lachrymalia.

DACRYOPÆUS (δακρυ, and ποιω, *to make*). An appellation given to substances which excite a flow of tears.

DACRYORRHOÏSIS (δακρυ, and ρυσις, *fluctio*). **DACRYORRHOEA.** A preternatural secretion of tears. Epiphora.

DACRYOSTAGON (δακρυ, and σταγων, *a drop*). Stillicidium lachrymarum.

DACRYOBLENNORRHOÏSIS (δακρυω, and βλεννα, *mucus*). A discharge of mucus from the lachrymal sac.

DACRYOCYSTITIS (δακρυω, and κυστις, *vesica*). Acute inflammation of the lachrymal sac.

DACRYOCYSTALGIA CACHOCHYMIA (δακρυω, *to weep*; αλγος, *pain*; κακοχυμια, *a redundancy of vitiated humours*). Inflammation of the lachrymal sac, occurring most commonly in persons of strumous diathesis.

DACRYOCYSTOATONIA. Atony of the lachrymal sac.

DACRYOCYSTECTASIS (δακρυω, κυστις, and εκτασις, *extensio*). Hernia of the lachrymal sac.

DACRYOILEMORRHYSIS (δακρυω, and αιμα, *blood*; ρεω, *to flow*). Effusion of tears mixed with blood.

DACRYOLITHIS. Calculus obstructing the nasal duct.

DASYMA. DASYTES SCLERIASIS (δασυτης, *roughness*, σκληρια, *hardness*). A thickened and indurated condition of the ciliary margin.

DICTITIS (δικτυων, *rete*). Inflammation of the retina.

DISTICHIASIS (δισ, *twice*; στικος, *a row*). A double row of cilia.

DIOPTRICS (δια, *through*, οπτομαι, *I see*). That branch of optics which treats of refracted light.

DIPLOPSIA (διπλοος, *double*; οψις, *vision*). Double vision.

DYSOPSIA (δυσ, *difficulter*; οψις, *vision*). Impaired vision. Hemeralopia.

EXTRACTION. An operation for cataract, in which the opaque lens is removed through an incision of the cornea.

ENCANTHUS (εν, *in*; κανθος, *angle of the eye*). Enlargement of the caruncula lachrymalis.

EPICANTHUS (επι, *upon*; κανθος, *angle of the eye*). A fold of skin projecting over the internal canthus, and covering the caruncula lachrymalis.

EPIPHORA (επι, *upon*; φερω, *to bring*). An undue secretion of the lachrymal fluid.

ENTOZOA. Internal or parasitic animals, sometimes seen in the eyes of man and other vertebralia.

EXOPHTHALMUS (εξ, *out*; οφθαλμος, *the eye*). Projection of

the globe from between the lids. When the organ is also inflamed, it is called exophthalmia.

ENTROPIDIUM (εν, and τρεπω, *to turn*). Inversion of the eyelids.

ECTROPIDIUM (εκτρεπω, *to divert, to turn out*). Eversion of the eyelids.

ECCHYMOSIS (εξ, *out*; χυμος, *juice*). Extravasation of blood beneath the conjunctiva.

EMPHYSEMA OCULI (εν, *within*; πον, *pus*). Suppuration of the eyeball.

EGYPTIAN OPHTHALMIA. Purulent ophthalmia, so called from its ravages among the troops composing the English and French expeditions to Egypt. It is particularly prevalent in that country.

FISTULA LACHRYMALIS. An ulcerated opening, sometimes remaining after ulceration of the lachrymal sac.

FISTULA CORNEÆ. An opening in the cornea, produced by ulceration.

FOSSA HYALOIDEA (υαλος, *crystal*; and ειδος, *likeness*). The depression on the anterior surface of the vitreous humour, occupied by the lens.

FUNGUS HÆMATODES (αιμα, *blood*, and ειδος, *likeness*). A malignant and generally fatal disease of the eye.

GRANDO. A white indurated tumour, remaining after an imperfectly suppurating sty.

GRANULAR CONJUNCTIVA. A morbid condition of the mucous lining of the palpebræ, consisting in an enlargement of the minute mucous glands and papillæ, the consequence of inflammation, and generally seen after purulent ophthalmia. By the German writers these glands are supposed to be the primary seat and elaboratory of that disease.

GLAUCOMA (γλαυκος, *a sea-green colour*). GLAUCEDO. GLAU-

cosis. An affection resembling amaurosis in many of its symptoms, and principally characterized by a green or yellowish appearance of the pupil, destruction of the septa hyaloidea, preternatural hardness of the globe, and great impairment, or total loss of vision. It is chiefly seen after the middle period of life, in persons of gouty and rheumatic diathesis; and is the consequence of a deeply-seated inflammation affecting the hyaloid membrane, retina, or choroid.

GERONTOXON (*γερων*, *old*; *τοξον*, *a bow*). An opaque circle around the margin of the cornea. Arcus senilis.

GONORRHOEAL OPHTHALMIA. Conjunctivitis caused by the application of gonorrhœal matter to the eye.

GUTTA SERENA. Complete amaurosis. A name given to this disease by the Arabians, in contradistinction to cataract or gutta obscura, vel opaca.

HEMOPHTHALMIA (*αιμα*, *blood*; *οφθαλμος*, *the eye*). See HYPOEMA.

HEMERALOPIA (*ημερα*, *day*; *αλαος*, *blind*; *ωψ*, *the eye*). Day blindness. Sometimes described as an intermittent amaurosis.

HEMIOPSIA (*ημι*, *half*; *οψις*, *vision*). An affection of the sight, in which the patient sees only half of an object.

HERNIA CORNEÆ. Protrusion of the capsule of the aqueous humour through an ulcer of the cornea.

HIPPUS IRIDIS. A term applied to the alternate contraction and dilatation of the iris sometimes seen accompanying spasmodic diseases.

HORDEOLUM (*hordeum*, *barley*). A small furunculous tumour on the margin of the palpebra.

HYALITIS (*υαλος*, *glass*). Inflammation of the hyaloid membrane.

HYDROPTHALMIA. HYDROPTHALMOS. HYDROPS OCULI (υδωρ, *water*; οφθαλμος, *the eye*). Dropsy of the eye.

HYDROPS SACCI LACHRYMALIS. Enlargement of the lachrymal sac, from the accumulating secretion.

HYPOBLEPHARON (υπο, *under*; βλεφαρον, *the eyelid*). An artificial eye.

HYPOEMA (υπο, *under*; αιμα, *blood*). An effusion of blood within the eye.

HYPOCHYMA (υπο, and χυμα, *effusio*). Cataract.

HYPOGALA (υπο, and γαλα, *milk*). Effusion of a milky fluid into the eye.

HYPOLYMPHIA. Extravasation of lymph into the anterior chamber.

HYPOPION (υπο, and πυνον, *pus*). Effusion of pus into the anterior chamber.

HYPERCERATOSIS (υπερ, *supra*, κερας, *cornu*). Hypertrophy of the cornea. A congenital defect, constituting a variety of dropsy of the anterior chamber.

IMPERFORATIO PUPILLÆ. Closure of the pupil by the continuance after birth, of the membrana pupillaris.

IRIS (ειρω, *to show*). The perforated membrane which extends across the globe, dividing it into two chambers. So called from its varied colour.

IRIDECTOMEDIALYSIS (ιρις, *iris*; εκτομη, *excision*; διαλυσις, *separation*). An operation for artificial pupil, performed by detaching the iris from its ciliary connexions, and excising the portion thus separated.

IRIDENCLEISIS (ιρις, and εγκλειω, *to enclose*). **IRIDONCLEPSIDIALYSIS.** An operation for artificial pupil, differing from the above, in that the separated portion of the iris, instead of being excised, is strangulated between the edges of an incision made in the cornea.

IRIDEREMIA (ιρις, and ερημος, *destitutus*). Absence of the

iris. The pupil extends to the cornea and ciliary ligament, and besides the impairment of vision, produces great sensibility to light.

IRIDODONESIS (ἰρις, and δονησις, *agitatio*). Oscillation of the iris.

IRIDOSCHISMA (ἰρις, and σχισμα, *fissura*). Congenital division of the iris. Coloboma iridis.

IRITIS. Inflammation of the iris.

IRIDODIALYSIS (ἰρις, and διαλυσις). Formation of an artificial pupil, by the simple separation of the iris from the ciliary margin.

IRIDOTOMIA (ἰρις, ἰδος; and τομη, *sectio*). Formation of an artificial pupil by incision.

KERATITIS (κερας, *horn*). Inflammation of the cornea.

KERATO-IRITIS. Inflammation of the capsule of the aqueous humour. Aquo-capsulitis.

KERATOMALACIA (κερας, and μαλακια, *softening*). Ramolissement or softening of the cornea from inflammation, as in purulent ophthalmia.

KERATONYXIS (κερας, and νυξις, *a puncture*). An operation for removing cataract by solution, in which the needle is introduced through the cornea.

KORETOMIA (κορη, *pupil*; τομη, *sectio*). Formation of an artificial pupil by incision.

KORECTOMIA. See CORECTOMIA.

LACHRYMATION. An undue secretion of tears.

LACHRYMAL CANALS. The ducts, or canaliculi which convey the tears into the lachrymal sac.

LACHRYMAL DUCTS. The excretory ducts of the lachrymal gland.

LACHRYMAL GLAND. The gland which secretes the tears, situated in the external and upper part of the orbit.

LACHRYMAL SAC. The receptacle for the tears, situated near the internal angle of the eye, and communicating with the nose through the nasal duct.

LAGOPHTHALMOS (λαγως, *a hare*; οφθαλμος, *the eye*). A disease in which, from inability to close the eyelids, the globe is left uncovered.

LEMOBITAS (λημμη, *lippietes oculi*). Inflammation of the angles of the eye.

LENTITIS. Inflammation of the crystalline lens.

LEUCOMA (λευκος, *white*). The dense white opacity of the cornea, following wounds or ulcers.

LEUCOPHLEGMATIA PALPEBRARUM. Serous effusion into the cellular tissue of the eyelids.

LIPPITUDO. The advanced stage of ophthalmia tarsi, in which the palpebral margins become thickened, indurated, and partially everted, so that the eye appears as if surrounded by a red circle.

LUSCITAS. Immovable distortion of the eyeball.

LYTHIASIS (λυθος, *a stone*). An imperfectly suppurating stye.

MACULA LUTEA. The small yellow spot in the posterior part of the retina.

MACULA. A small opaque speck on the cornea.

MARMARYGAI (μαρμαίρω, *resplendo*). An appearance as of sparks or coruscations passing before the eyes.

MADAROSIS (μαδαρω, *to make bald*). A falling out of the cilia.

MEIBOMIAN GLANDS. So named from their discoverer, Meibomius; minute glands secreting an unctuous matter, situated beneath the mucous membrane of the eyelids.

MELANOSIS (μελανω, *to blacken*). A malignant and constitutional disease, attended with the deposition of a black, grumous matter; sometimes making its appearance in the eye.

MEMBRANA HYALOIDEA (υαλος, *crystal*; ειδος, *likeness*). The

membrane which secretes, and contains the vitreous humour.

METAMORPHOPSIA (μεταμορφωω, *to transform*; οψις, *vision*).

Confused or distorted appearances, sometimes seen by persons affected with amaurosis.

MILIUM. A small white tumour, resembling a millet seed, situated on the border of the eyelid.

MICROPTHALMIA. Congenital atrophy of the eye, from an arrest of developement in all its parts. Some degree of vision is occasionally preserved, but more generally it is entirely lost. The opposite condition, or hypertrophy of the eye, is termed Megalophthalmia, and is the result of various morbid alterations.

MILPHOSIS (μιλφωσις, *defluvium pilorum palpebræ*). A baldness of the eyebrows.

MONOCULUS (μονος, *one*). A bandage for the eyes.

MOTORES OCULORUM. The third pair of nerves.

MONOBLEPSIS (μονος, *single*; βλεψις, *sight*). A sympathetic affection, in which vision, distinct with one eye, is confused when the patient regards objects with both.

MUSCÆ VOLITANTES (*musca, a fly*). A fanciful appellation given to an appearance as of particles of various forms, sometimes thought to bear some resemblance to insects, &c., moving before the eyes; frequently accompanying the formative stage of amaurosis, but often existing unconnected with that affection.

MYOCEPHALON (μυια, *a fly*, and κεφαλη, *the head*). A small protrusion of the iris through a wound or ulcer of the cornea, supposed to resemble the head of a fly.

MYDRIASIS (μυδαω, *to abound in moisture*). Preternatural dilatation of the pupil, formerly supposed to be caused by an undue secretion of the humours.

MYODESOPIA (μυς, *a mouse*; ειδος, *likeness*; and ωψ, *the eye*).

See MUSCÆ VOLITANTES.

MYOPIA ($\mu\upsilon\omega$, *to shut*, and $\omega\psi$, *the eye*). Near-sightedness.

MYOSIS ($\mu\upsilon\omega$). Unnatural contraction of the pupil.

NASAL DUCT. The passage leading from the lachrymal sac into the nose.

NEBULA. A light superficial opacity of the cornea.

NICTITATION. An involuntary twinkling of the eyelids.

NYSTAGMUS ($\nu\sigma\tau\alpha\gamma\mu\omicron\varsigma$, *dormitatio*). Oscillation of the eyeball.

NYCTALOPIA ($\nu\gamma\chi$, *night* ; $\alpha\lambda\alpha\omicron\varsigma$, *blind* ; $\omega\psi$, *the eye*). Night blindness.

OBLIQUI. The obliquus superior and inferior muscles of the eye.

OCULUS. The eye.

OCULUS BOVINUS (*bos*, *an ox*). An enlargement of the eye caused by disease. Hydrophthalmus. Buphthalmus.

OCULUS LEPORINUS (*lepus*, *a hare*). See Lagophthalmus.

ONYX ($\omicron\nu\gamma\chi$, *a nail*). A purulent deposition between the laminæ of the cornea, resembling the white appearance at the root of the nails ; more commonly the effusion is in the anterior chamber.

OPHTHALMIA ($\omicron\phi\theta\alpha\lambda\mu\omicron\varsigma$, *the eye*). A general term for inflammation of the eye.

Contagiosa or *Purulenta*. Purulent ophthalmia.

Catarrhalis or *Mucosa*. Catarrhal ophthalmia.

Gonorrhœica. Gonorrhœal ophthalmia.

Morbillosa. Ophthalmia consequent upon measles.

Neonatorum ($\nu\epsilon\omicron\varsigma$, *juvenis*). Purulent ophthalmia of infants.

Searlatinosa. Ophthalmia following scarlatina.

Erysipelatosa or *Serosa*. Erysipelatous ophthalmia.

Tarsi. Inflammation of the borders of the eyelids.

Variolosa. Ophthalmia following small-pox.

OPHTHALMIC. Relating to the eye.

OPHTHALMITIS. Inflammation of the globe.

OPHTHALMITIS INTERNA or EXTERNA. Inflammation affecting more particularly the internal or external tissues of the eye.

OPHTHALMO-BLENNORRHOEA (οφθαλμος; βλεννη, *mucus*; ρεω, *to flow*). Purulent ophthalmia.

OPHTHALMOMALACIA. See KERATOMALACIA.

OPHTHALMODYNIA (οφθαλμος, οδυνη, *pain*). Violent pain in the eyeball. Neuralgia.

OPHTHALMOLOGY (ο. and λογος, *a discourse*). 'The science of medicine in relation to the eye.

OPHTHALMOPLEGIA (ο. πληγη, *a blow or stroke*). Paralysis of the muscles of the eyeball.

OPHTHALMOPONIA (ο. πονεω, *to labour*). Intense pain in the eye.

OPHTHALMOPTOSIS (ο. πτοσις, *a falling down*). Displacement of the eyeball.

OPHTHALMORRHAGIA (ο. ρεω, *to flow*). Hemorrhage from the eye or palpebræ.

OPHTHALMOS (οπτομαι, *to see*). The eye.

OPTOMETER. An instrument for measuring the limits of distinct vision.

ORBITA. The bony cavity which contains and protects the eyeball.

OCCUSIO PUPILLÆ. Closure or imperforation of the pupil.

OXYOPIA (οξύς, *sharp*; ωψ, *the eye*). Called also GALERPIA, (γαλη, *felis*). Acuteness of vision from increased sensibility of the retina; the patient being able to see objects more distinctly in the shade and in the dusk of evening, than in a strong light. It is occasionally a symptom of incipient amaurosis, and is observed in individuals who have been long confined in dark places. It is also seen accompanying the various degrees of albinism.

PACHEABLEPHARA. PACHYTES (*παχυσ*, *thick*; *βλεφαρον*, *the eyelid*). Enlargement and thickening of the eyelid.

PALPEBRÆ (*a palpitando*, from their frequent motion). The eyelids.

PANNUS (*pannus*, *cloth*). A thickened vascular condition of the conjunctiva, covering the cornea.

PLADAROTES (*πλαδαρος*, *præhumidus*). See GRANULAR CONJUNCTIVA.

PAROPSIS (*παρα*, *male*; *οψις*, *visus*). Diseased or depraved vision.

PLATYCOREA (*πλατυς*, *broad*; *κορη*, *the pupil*). Dilatation of the pupil.

PATHETICI. The fourth pair of nerves or trochleares.

PHALANGOSIS (*φαλαγξ*, *a row of soldiers*). Inversion of the cilia.

PRESBYOPIA (*πρεσβυς*, *old*; *ωψ*, *the eye*). Far-sightedness.

PTERYGIUM (*πτερυξ*, *a wing*). A morbid production of a triangular shape, usually growing from the internal angle of the eye, and supposed to have its seat in the subconjunctival cellular tissue.

PIITHEIRIASIS (*φθειριασις*, *pedicularis morbus*). Pediculi attached to the roots of the eyelashes.

PINGUECULA (*Pinguis*, *fat*). A little tumour, apparently adipose, sometimes growing on the conjunctiva.

PERIORBITA. The fibrous membrane lining the orbit.

PERIBROSIS (*περι*, *about*; *βρωσις*, *erosion*). Inflammation of the canthi, attended with excoriation.

PTILOSIS (*πτιλος*, *balid*). Loss of the cilia.

PIGMENTUM NIGRUM. The dark colouring matter secreted by the vessels of the choroid membrane. It becomes of a lighter colour as life advances, is wanting in the albino, and is absorbed in various diseases, as glaucoma, &c.

PHTHISIS PUPILLÆ. Contraction of the pupil.

PIITINIS OCULI. Collapse or shrinking of the eyeball.

PROPHYSIS (προ; φύσις, *natura*). Adhesion of the globe to the eyelid.

PHOTOPHOBIA (φως, *light*; φοβέω, *to dread*). Intolerance or dread of light.

PHOTOPSIA (φως, *light*; ὁψις, *vision*). Luminous appearances sometimes seen in amaurosis and other affections.

POSTERIOR CHAMBER. The part of the eyeball immediately behind the iris, occupied by the aqueous humour.

PROLAPSUS IRIDIS. Protrusion of the iris through an ulcer or wound of the cornea.

PROTOPSIS (προ, *before*; πίπτω, *to fall*). Protrusion of the globe between the palpebræ.

PSOROPHTHALMIA (ψώρα, *scabies*; οφθαλμος). Inflammation of the margin of the palpebræ, frequently attended with a troublesome pruritus, and therefore supposed to be of psoric origin.

PTOSIS (πίπτω, *to fall*). Paralysis of the upper eyelid.

PUNCTA LACHRYMALIA. The orifices of the lachrymal canaliculi at the inner canthus of the eye.

PUPIL (*pupilla*). The aperture in the centre of the iris for the passage of light to the retina.

PURULENT OPHTHALMIA. Conjunctivitis, accompanied with the secretion of a purulent matter.

PUSTULAR OPHTHALMIA. Conjunctivitis attended with pustules; it is generally of a strumous character.

PHLYCTENULE (φλυκταιναι, *small bladders*; from φλυζω, *to be hot*). Vesicles containing a watery fluid.

RECLINATION. A mode of operating for cataract in which the lens is turned backwards into the vitreous humour, on a line with the inferior margin of the pupil.

RETINA (*rete, a net*). The nervous expansion on the inner surface of the eye, for receiving the impression of light.

RETINITIS. Inflammation of the retina.

RHEUMATIC OPHTHALMIA. Inflammation of the sclerotica, produced by atmospherical vicissitudes.

RHEXIS, OR RHEGMA OCULI (ρηγμα, *a rupture*). Rupture of the eyeball.

RHINORAPHY (ρινος, *nasus* ; ραφη, *sutura*). An operation performed for the cure of epicanthus.

RHINOLITHES. Calculus obstructing the lachrymal sac or nasal duct.

RHOCAS (ροικος, *qui fluctione laborat*). RHACOSIS. RYAS. Lachrymation from destruction of the lachrymal caruncle, the tears accumulating in the inner angle of the eye, and flowing over the cheek.

RHYTIDOSIS (ρυτις, *a wrinkle* ; ερω, *to draw*). Collapse of the cornea.

STAPHYLOMA (σταφυλη, *a grape*). Projection of the cornea in the form of a whitish or pearl-coloured tumour. The term is applied also to the bluish projections of the sclerotica, caused by the pressure of the distended choroidal vessels, and the fluid contents of the globe.

STAPHYLOMA RACEMOSUM (*racemus, a bunch of grapes*). Protrusion of the iris through several ulcers in the cornea, exhibiting an appearance not unlike a cluster of berries.

STAPHYLOSIS. A protrusion or protuberance of the choroid from attenuation of the sclerotica.

STRABISMUS (στραβιζω, *to squint*). Squinting, a disease which consists in some deviation of the optic axes from their uniform directions.

SCHEROMA. Dryness of the eye, from a defect of the secretion of tears.

SCLEROTICA (σκληρος, *hard*). The firm white fibrous membrane, which invests the eye, and preserves the form of the organ.

SCLEROTITIS. Inflammation of the sclerotica.

SCLEROTIECTOMIA (σκληροϋς, and εκτομη, *excisio*). Formation of an artificial pupil by excision of a portion of the sclerotica, the cornea being opaque. It has been performed on some of the inferior animals, but, as might have been expected, without success.

STENOCHERIA (στενοχωρια, *angustus locus*). Obstruction of the nasal duct.

SECONDARY CATARACT. An opaque capsule remaining after the absorption of the crystalline.

SCIRROPHTHALMIA. Cancer of the eye.

STILICIDIUM (*stillo, to drop; calo, to fall*). A complaint in which the tears fall over the cheek, owing to some obstruction in the excretory portion of the lachrymal organs.

SCOTOMATA (σκοτωω, *to darken*). Dark spots sometimes seen in amaurosis.

SCROPHULOUS OR STRUMOUS OPHTHALMIA. Inflammation of any of the tissues of the eye, modified by the strumous diathesis.

SUFFUSION. A general term employed by ancient authors to denote imperfection or loss of sight, whether caused by opacity of the lens, or affection of the nervous structure,—the latter receiving the specific designation of *nigra* or *serena*, from the black appearance of the pupil.

“Thee, I revisit safe,
And feel thy sovereign lamp; but thou
Revisit'st not these eyes, that roll in vain
To find thy piercing ray, and find no dawn.
So thick a *drop serene* has quenched their orbs,
Or dim *suffusion* veiled.”

STYE. A little furunculous tumour on the margin of the eyelid.

SYMBLEPHARON (συν, *together*, and βλεφαρον, *eyelid*). Adhesion of the eyelids to the globe.

SYNCHISIS (συγχυω, *to confound*). Dissolution of the vitreous humour, from absorption of the septa of the membrana hyaloidea.

SYNECHIA ANTERIOR (συνεχεια, *continuity*). Adhesion of the iris to the cornea.

SYNECHIA POSTERIOR. Adhesion of the uvea to the capsule of lens.

SYNIZESIS (συνιζησις, *a flowing together*). Closure of the pupil.

TARSORAPHIA (ταρσος, *tarsus*; ραφη, *a suture*). Excision of the tarsal margins; sometimes practised for the cure of ectropium.

TARSUS. The firm elastic cartilage which forms the border of each eyelid, and preserves its even expansion, and accurate adjustment to the globe.

TARAXIS (ταρασσω, *to disturb*). A slight degree of conjunctivitis.

TRAUMATIC CATARACT (τραυμα, *a wound*). Opacity of the lens, produced by injury.

TRACHOMA (τραχος, *rough*). See PSOROPHTHALMIA.

TELANGIECTASIA OCULI. Staphyloma of the sclerotica.

TREMOR IRIDIS. Oscillation of the iris.

TRICHIASIS (τριξ, *a hair*). Inversion of the cilia.

TRICHOSIS BULBI. Hairs growing from the globe of the eye.

TUNICA ARANEÆ (αρανης, *a spider*). The capsule of the lens.

TUNICA JACOBI. A thin delicate membrane between the choroid and retina, so called from its discoverer.

TUNICA RUSCHIANA. The internal lamina of the choroid, seen only in animals.

TYLOSIS (τυλος, *callosity*). Thickening and induration of the ciliary margins.

UVEA (*uva, an unripe grape*). The posterior surface of the iris, supposed in animals to bear some resemblance to an unripe grape.

UNGUIS. A collection of matter between the laminæ of the cornea.

VISUS COLORATUS. A defect of vision, in which objects appear surrounded by various colours; occasionally observed in amaurosis.

Defiguratus. Vision attended with a confused or distorted appearance of objects.

Dimidiatus. Vision attended with the perception of only one-half of an object.

Duplicatus. Double vision.

Lucidus. An appearance as of flashes of light before the eyes. Photopsia.

Muscarum. An appearance as of flies, or minute insects passing before the eyes.

Nebulosus. Vision in which objects appear as if enveloped in a cloud or mist.

Reticulatus. Objects appearing as if seen through a net-work or gauze.

VITREOUS HUMOUR. The transparent fluid secreted by the hyaloid membrane, and occupying the posterior portion of the eye.

XEROMA (*ξηρος, dry*). An affection in which the conjunctiva, though unchanged in appearance, imparts to the patient a sensation of unnatural dryness. In such cases, it is supposed to arise from obstruction of some of the lachrymal ducts. When it occurs as a symptom in the early stage of ophthalmia, it is owing to deficient secretion on the part of the lachrymal gland. Xerophthalmia.

XEROSIS. A term applied to a peculiar dry and shrivelled condition of the conjunctiva.

XEROPHTHALMIA. Inflammation, with dryness of the conjunctiva; a frequent symptom in the early stage of ophthalmia.

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